CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE SHORELINE OF BIG SANDY RESERVOIR, AITKIN COUNTY, MINNESOTA: 1982

Submitted to:

The U.S. Army Corps of Engineers

Saint Paul District

(Contract No. DACW37-81-M-2669)

by

Guy Gibbon

Principal Investigator

and

Terri Leistman

Field Director

The University of Minnesota

Minneapolis, Minnesota

February 15, 1984

CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE SHORELINE OF BIG SANDY RESERVOIR, AITKIN COUNTY, MINNESOTA: 1982

Submitted to:

The U.S. Army Corps of Engineers

Saint Paul District

(Contract No. DACW37-81-M-2669)

by

Guy Gibbon Guy Gibbon

Principal Investigator

and

Terri Leistman

Field Director

The University of Minnesota

Minneapolis, Minnesota

February 15, 1984

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE SHORELINE OF BIG SANDY RESERVOIR, AITKIN COUNTY, MINNESOTA: 1982.		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Guy Gibbon, Principal Investigator Terri Leistman, Field Director		8. CONTRACT OR GRANT NUMBER(s) DACW37-81-M-2669
9. PERFORMING ORGANIZATION NAME AND ADDRESS The University of Minnesota Minneapolis, Minnesota 55455		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, St. Paul 1135 USPO & Custom House St. Paul, Minnesota		12. REPORT DATE February, 1984
		13. NUMBER OF PAGES 108 p.
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)*
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

Lake map folded inside back cover.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

ARCHAEOLOGY
RESERVOIRS
MINNESOTA
PRESERVATION

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The 1982 archaeological reconnaissance survey of the shoreline of the Big Sandy Lake Reservoir is in many ways a companion to an extensive survey completed in 1977-78 by G. Joseph Hudak and Timothy L. Ready. The 1982 survey was able to examine previously unsurveyed areas of Big Sandy Lake, as well as shorelines of Aitkin and Flowage lakes, and part of the shoreline of Big Sandy River Lake. Fifteen sites or "find" sports were located. Only one is threatened by extensive erosion. An additional 22 sites previously reported were also examined. One of these sites is subjected to heavy erosion and

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

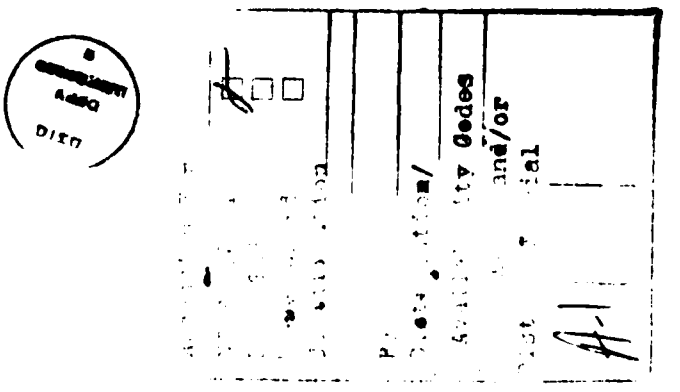
SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

should be conserved.

Recommendations are made concerning potential public-use development of the sites and find spots. The conclusions of this survey support and add to the conclusions drawn in the Hudak-Ready survey. The most important of these are: 1. A large number of archaeological sites representing a long time span occur or at least once occurred within the reservoir area; 2. The construction of the Big Sandy Lake Reservoir dam has significantly damaged the archaeological resources within the reservoir area; 3. Every effort should be made to protect or investigate the few remaining sites along the shoreline and preserve their primary context.

1. ABSTRACT

The 1982 archaeological reconnaissance survey of the shoreline of the Big Sandy Lake Reservoir is in many ways a companion to an equally extensive survey completed in 1977-78 by G. Joseph Hudak and Timothy L. Ready (1978). Because of unusually wet weather, some areas of the reservoir were not examined during this earlier survey. It is many of these unexamined areas that were surveyed in 1982. The 1982 survey was able to examine all remaining unsurveyed areas of Big Sandy Lake, as well as the shorelines of Aitkin and Flowage lakes, and part of the shoreline of Big Sandy River Lake. Fifteen new sites or "find" spots were located during the survey. Only one (21 AK 50) of these sites or find spots is threatened by extensive erosion; it is recommended that this site be evaluated as soon as possible. An additional twenty-two sites or find spots either previously reported by archaeologists or reported by local landowners and other interested individuals were also examined. One of these sites (21 AK 29), reported by Hudak and Ready, is being subjected to heavy erosion and should be conserved. Recommendations are made concerning the potential public-use development of the sites and find spots examined during the 1982 survey, and their potential eligibility for nomination to the National Register of Historic Places. None of these sites or find spots are recommended for nomination to the National Register of Historic Places. The conclusions of this reconnaissance survey support and add to the conclusions drawn in the Hudak-Ready survey. The most important of these conclusions are: 1) A very large number of archaeological sites representing a long time span occur or at least once occurred within the reservoir area; 2) The construction of the Big Sandy Lake Reservoir dam has significantly damaged the archaeological resources within the reservoir area; 3) Every effort should be made to protect or investigate the few remaining sites along the shoreline that retain their primary context. Those sites or find spots whose significance could not be determined during the 1982 survey should be evaluated as soon as possible.



2. MANAGEMENT SUMMARY

2.1 The cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir in Aitkin County, Minnesota, reported in this study was done in partial fulfillment of the obligations of the St. Paul District regarding cultural resources, their location, and preservation. The pertinent Federal laws are listed in Chapter 5 (Theoretical and Methodological Overview) and in section 1.02 of Appendix A. The Contractor was Dr. Guy E. Gibbon, Associate Professor of Anthropology at the University of Minnesota, Minneapolis.

2.2 This cultural resources investigation involved a Phase one cultural resources survey of those lands along the shoreline of Big Sandy, including all islands, not previously surveyed (as shown on Map 2 attached to the backcover of this report). If time and funds allowed, a Phase one cultural resources survey was also to be conducted along the shoreline of Aitkin Lake (approximately 13 miles). The area to be surveyed was to include all lands within 50 meters of the water's edge and all islands in their entirety. Nineteen additional sites or unverified find spots were to be field checked and evaluated. The precise survey specifications, and the location of specific sites and unverified find spots that were to be checked, are contained in section 4 of Appendix A. A Phase one cultural resources survey is defined as an intensive, on-the-ground survey and testing of an area in order to determine the number and extent of the archaeological, historic, and architectural resources present and their relationship to all the project alternatives and features. A more extensive definition of a Phase one survey is contained in section 3.05 of Appendix A. A literature and records search and review, and Phase two testing, were not required in this study. The entire budget for this study was $5000; funding for the study was managed by the University of Minnesota. The complete Scope of Work for this study is reproduced in Appendix A.

2.3 The 1982 cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir was conducted by Terri Liestman (field director), Susan McCanna, Gary Staupe, and Eugene Willms between June 12 and July 4, 1982. The crew, which traveled as a team in a boat, began the survey by examining those areas of Big Sandy Lake not examined in previous surveys; they then examined as much shoreline along other lakes in the reservoir system as time and finances permitted. The laboratory analysis of recovered materials was conducted by Terri Liestman in the Wilford Laboratory of Archaeology at the University of Minnesota in September and October of 1982. Since a literature and records search and review was not required, none was conducted. The results of the survey and the recommendations that resulted from it are reviewed in section 2.5 and 2.7 below. Chapters 5 (Theoretical and Methodological Overview) and 6 (Field Methods) contain a more extensive discussion of the theoretical and methodological framework of the study, and of the field methods employed.

2.4 The 1982 cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir experienced two limitations. The first was the relatively high waterlevel of the reservoir during the months of June and July in 1982. Many potential site areas around the shoreline had been inundated following the construction of the Big Sandy Reservoir dam. In some instances the extent of inundation was startlingly large. For example, only one-quarter of Battle Island is now above water. Many potential site areas were not, then, accessible to the survey crew. The second limitation was the absence of landowners - which is common in summer resort areas. Since we could not obtain permission to shovel-test in these areas, a visual inspection of exposed land surfaces had to suffice. These areas are mentioned in Chapter 7 (Site Descriptions, Evaluations, and Recommendations). Over 97% of the area surveyed was, however, shovel-tested.In general, the weather during the survey was very good. As a result, a much more extensive area was surveyed than anticipated. The extent of this area is mentioned in section 2.5 below and is indicated on Map 2 on the backcover of this report.

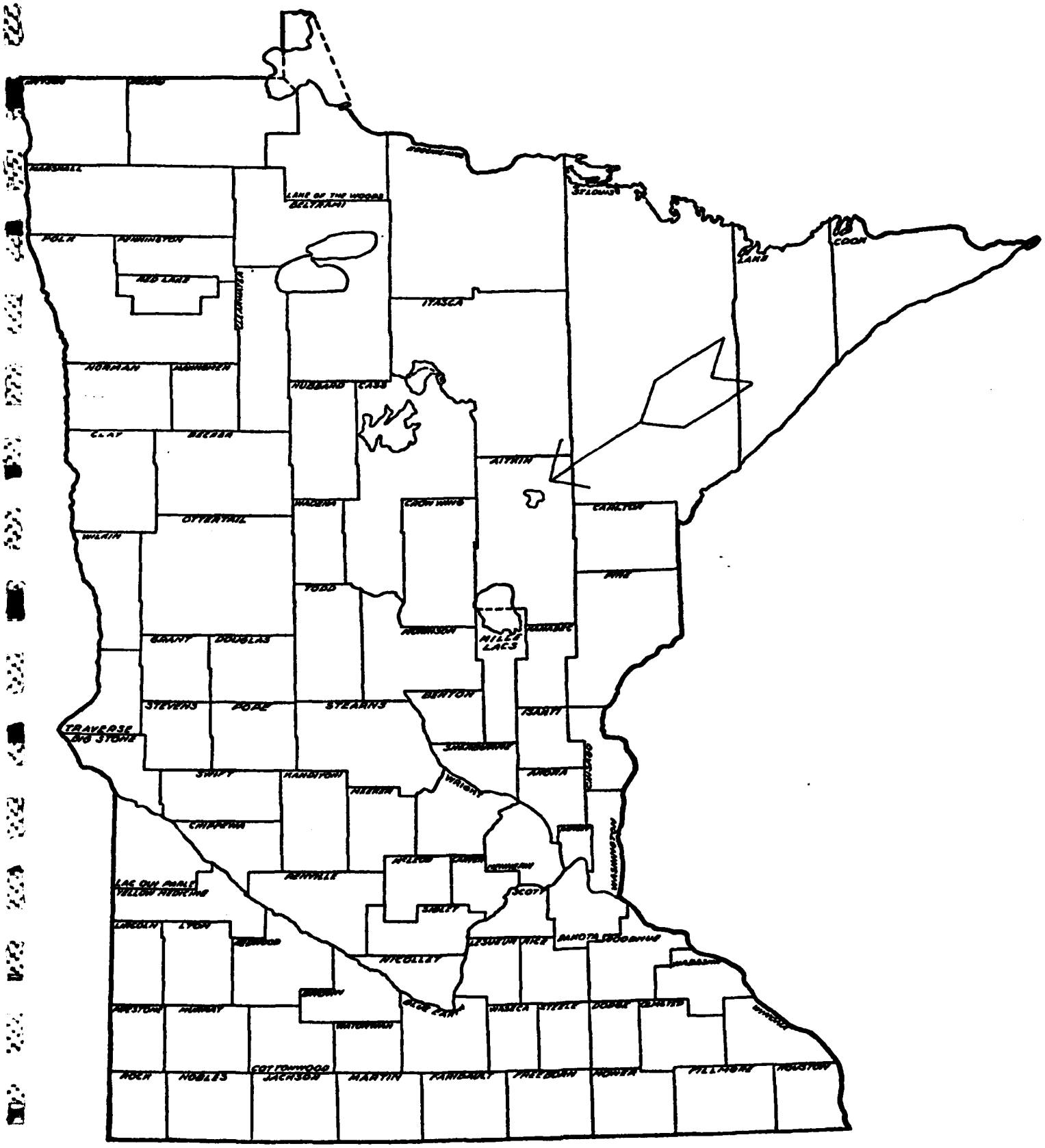
2.5 The 1982 cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir completed the investigation of all required areas in Big Sandy Lake, and surveyed substantial areas of Aitkin, Sandy River, and Flowage lakes; these areas are indicated on Map 2 attached to the backcover of this report. In nearly all cases, those areas not surveyed around these latter lakes were very marshy and difficult to approach by boat. A total of 15 new sites or find-spots were located during the 1982 reconnaissance of the Big Sandy Reservoir shoreline. These sites or find-spots are extensively described and evaluated in Chapter 7 (Site Descriptions, Evaluations, and Recommendations).

2.6 Of the many conclusions drawn in this study, four have particular significance. First, the most dense concentration of archaeological sites seems to occur around the shoreline of Big Sandy Lake. This statement is qualified, because many potential site areas have been inundated by reservoir waters. Second, archaeological sites within the reservoir system seem small in size and in general lack extensive faunal and floral remains as well as cultural features and obvious stratigraphic separation between components. In general, a Phase one survey is not sufficient to identify the function of a site, except where cultural features such as ricing-jigs are present. Third, many archaeological and some historic sites have been inundated by the raised water-level of the reservoir system. This event has apparently destroyed many of these sites and resulted in the creation of "secondary" deposits of cultural material on the present shoreline through wave action. By their very nature, these secondary sites lack primary context and significant stratigraphic information. Fourth, the general conclusions of this study support those conclusions reached by Hudak and Ready in their 1978 reconnaissance survey of a portion of the shoreline of Big Sandy Lake (Hudak and Ready 1978).

2.7 A number of recommendations are made in this study. First, although most cultural resources surveys are conducted during the summer months when trained personnel are most readily available, the most efficient time to conduct a reconnaissance survey of reservoir areas where the water-level has been significantly raised (such as the Big Sandy Reservoir system) is during spring and fall months when the water-level is at its lowest and survey remains possible (e.g., ice does not cover the shoreline). While these are the months of maximal site exposure, on the negative side these are also periods when land-owners are difficult to locate in summer resort areas. Second, of the 15 new sites or find-spots located during the survey, no immediate action is recommended for 14 of them (field numbers 41 - 50 and 52-55); one of these sites (field number 51) is threatened with destruction and shovel-testing should be performed when possible to determine whether a Phase two survey is necessary. Although no immediate action is recommended for 14 of the 15 sites located, a number of them should be shovel-tested or checked again for newly redeposited materials when possible (these include field numbers 41 - 43 and 43 - 49). Third, an effort should be made to determine whether 21 AK 28 does consist of burial mounds that should be protected from further erosion. Of a reported 32 mounds, only 4 were located by the survey crew; either the remaining mounds have eroded off the present shore or are now so worndown that they are no longer visible from the surface. It is impossible to determine whether these mounds are cultural features without excavation or the use of subsurface detection devices such as ground penetrating radar. We should assume they are burial mounds and protect them from further erosion until a more precise determination can be made. Fourth, two historic sites (field numbers 4 and 29) reported by the Hudak-Ready survey should be considered for potential nomination to the National Register of Historic Places. The first is a Northwest Company fur post that is threatened by erosion along its eastern edge (other structures associated with this site have already been inundated by reservoir waters). The second is 21 AK 29, an historic, protohistoric, and possibly prehistoric burial ground on BIA land. Sufficient information now exists on these two sites, that Phase two surveys are probably not necessary to make a determination regarding their candidacy for nomination to the National Register. Fifth, although specific details are not given here, it is recommended that a number of the "unverified find spots" be reinvestigated when possible (unverified find spot numbers 4, 13, 15, and 18 as listed in Chapter 7). More detailed evaluations and recommendations for each site, find-spot, or unverified find-spot are contained in Chapter 7 (Site Descriptions, Evaluations, and Recommendations).

2.8 All collected cultural materials recovered during the survey are now housed in the Wilford Laboratory of Archaeology at the University of Minnesota; notes, photographs, and field maps are housed in the offices of the St. Paul District of the U.S. Corps of Engineers.

TABLE OF CONTENTS



Map 1. Location of Big Sandy Lake in Aitkin County

3. INTRODUCTION

The cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir reported here is in many ways a companion to an equally extensive survey conducted by G. Joseph Hudak and Timothy L. Ready in 1977-78 (Hudak and Ready 1978). Because of unusually wet weather, the Hudak-Ready survey was unable to examine all of the shoreline of the reservoir. It is most of this unexamined area that was surveyed by a four-person University of Minnesota crew between June 12 and July 4, 1982. Terri Liestman, a graduate student at the University of Minnesota, served as field director; the senior author of this report served as Principal Investigator. Terri Liestman also curated and analyzed all recovered cultural materials in late October and in September of 1982 in the Wilford Laboratory of Archaeology at the University of Minnesota. Both the Hudak-Ready survey and this study were sponsored by the St. Paul District of the U.S. Army Corps of Engineers in partial fulfillment of the obligations of the St. Paul District regarding cultural resources as detailed in a number of Federal documents (see section 1.02 of Appendix A).

Big Sandy Reservoir is located about 120 miles north of the Twin Cities in Aitkin County, Minnesota (Map 1). The eight natural lakes encompassed in this drainage area include Sandy, Aitkin, Sandy River, Rat, Flowage, Round, Davis, and Tiesen lakes. Construction of the Sandy Lake Dam, located on the Sandy River 1-1/4 miles above the junction of the Sandy and Mississippi rivers, has raised the water-level of the lake system approximately 9 feet. This event has increased the size of the lake area from only 8 square miles to 16.6 square miles. The forest vegetation surrounding Big Sandy Lake is principally deciduous. Elm-ash with some aspen and oak is found at lower elevations associated with marsh habitats. Maple-basswood intermixed with aspen and oak is predominant. There are almost no pure pine stands, although there are some pine-mixed hardwood communities on the east and southeast shore of Big Sandy. Aitkin County, in which Sandy Lake is located, is predominantly till plain with a large outwash area immediately to the northeast characterized by surface deposits of sand and gravel. The soil of the till plain area is brownish and slightly acidic, with pebbles and boulders of granite and gneiss. The shoreline is highly irregular with moderate on and off-grades such that a 1-foot vertical change in the water level can alter the shoreline 5 to 20 feet horizontally. There are some exceptionally flat areas, but the lake edge is almost totally uniform in the 5 to 19 percent slope range. Culturally, the Big Sandy Reservoir is within an extensive "North Woods" habitat that has partially constrained and channeled the adaptations of both its prehistoric and historic occupants. Chapter 4 (Background) reviews the environmental setting and culture history of the survey area.

Since the Hudak-Ready survey was the first large scale survey in the reservoir area, most of the locally known sites and much of the

more accessible shoreline were visited. This pattern of investigation determined to a large extent the nature of the 1982 survey. The shoreline investigated by the 1982 survey crew was largely marshland that was difficult to penetrate and low in expected site potential. This difference in the nature of the areas surveyed in 1977-78 and 1982 largely explains the differences in numbers of sites located in the two surveys. Map 2 attached to the inside of the backcover indicates the extent of the Hudak-Ready survey and the shoreline areas investigated in 1982. Sections 4.01 - 4.07 in Appendix A detail the survey specifications; Appendix A itself is a copy of the Scope of Work for this study. In brief the 1982 survey examined all lands within 50 meters of the water's edge and all islands in their entirety not previously investigated in Big Sandy Lake, and substantial shoreline areas of Aitkin, Sandy River, and Flowage lakes. Standard shovel-testing and visual search procedures were used in the ground investigation. In order to insure comparability of results, the survey procedures adopted by the Hudak-Ready survey were followed as closely as possible (see Hudak and Ready 1978:26-30). A discussion of the theoretical and methodological overview, and the field methods, employed during this study are contained in chapters 5 and 6.

The cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir reported here is a "Phase one cultural resources survey." A "Phase one cultural resources survey" is defined as an intensive, on-the-ground survey and testing of an area in order to determine the number and extent of the archaeological, historic, and architectural resources present and their relationship to all the project alternatives and features. The purpose of a Phase one survey is to obtain data adequate to assess the general nature of all sites present; to recommend additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information; and to provide detailed time and cost estimates for Phase two testing. A literature and records search and review, and Phase two testing, were not required in this study. Detailed definitions of these terms can be found in section 3 of Appendix A. All cultural materials recovered during this survey are presently stored in the Wilford Laboratory of Archaeology at the University of Minnesota; field notes, maps, and photographs are presently stored in offices of the St. Paul District of the U.S. Army Corps of Engineers.

This study report proceeds in the following manner. Chapter 4 (Background) reviews the environmental setting and culture history of the survey area, and previous investigations. Although tentative in its nature, the reconstructed culture history of the region within which the study area is situated is meant to be suggestive in deciphering site function. Chapter 5 contains an overview of the theoretical and methodological frameworks that guided the study. Chapter 6 is a discussion of field methods. Site descriptions, evaluations, and recommendations are contained in Chapter 7. This chapter contains those sections of a report generally labeled "Analysis," "Investigation Results," "Evaluation and

Conclusions," and "Recommendations." Chapter 8 reviews the major conclusions and recommendations of the study. Cited references follow Chapter 8, and the Scope of Work and the vita of the Principal Investigator are included in appendices A and B.

The major goals of this study are (1) to recover data adequate to assess the nature of all sites present in surveyed areas, (2) to recommend additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information, and (3) to detail time and cost estimates for Phase two testing. In addition this study attempts to assess the significance of the information recovered to the reconstruction of the culture history of the region and to the successful management of the cultural resources of the reservoir area by the U.S. Army Corps of Engineers.

4. BACKGROUND

Archaeological surveys are conducted within a framework of expectations. These expectations are based upon the environmental setting of the survey area, the culture history of the region within which it is situated, and the knowledge gained from previous archaeological investigations. These three sources of information are reviewed below.

A. Environmental Setting

Big Sandy Lake is what geologists call an ice-block lake. Lakes of this type are formed when one or more extremely large blocks of ice which are trapped within a moraine complex melt and form a lake basin. Big Sandy Lake and its surrounding till plains, terminal moraines, proglacial lakes, outwash deposits, and other glacial features are products of the multiple glaciations of the Superior lobe ice mass, especially the ice mass of the last or Wisconsin glacial period. Successive glacial surges approached the area of the present lake from the east and northeast, which accounts for the orientation of most but not all of the existing glacial remnants and for the presence of red Superior lobe till in the sub-soil. The eastern terminus of the St. Louis sublobe of the Des Moines lobe also reached the Big Sandy Lake area and deposited a thin layer of calcareous western yellow till over the Superior red till. The bedrock beneath these glacial remnants is a formation of patchy cretaceous sandstone and clay which extends from the Big Sandy Lake area across the north-central section of the state of Minnesota to the North Dakota border. An argillite bedrock formation lies immediately to the south and east of the Big Sandy Lake area (Wright 1972). Big Sandy Lake itself probably formed about 12,000 B.P. with the retreat of the final Wisconsin ice mass and the melting of the remaining ice blocks. A succinct and informative review of the glacial history of Minnesota can be found in Ojakangas and Matsch (1982).

Today, the Big Sandy Lake Reservoir is situated in a modern Mixed Coniferous-Hardwood vegetation zone. This zone is composed of Boreal forest vegetation penetrating southward and deciduous forest vegetation gradually fading in numerical importance to the north. The transitional nature of this zone is reflected in the composition of its dominant tree species: oak, maple, basswood, elm, and ash from the Deciduous forest, and white pine, red pine, jack pine, fir, and spruce from the Boreal forest.

The vegetative cover of the land surrounding the Big Sandy Lake Reservoir area has changed dramatically in both the prehistoric and historic periods. Pollen profiles from the Rossburg Bog, Kotiranta Lake, and Jacobson Lake document these dramatic changes (see Wright and Watts 1969, and Birks 1976 and 1981,

for summary). The paleo-environmental vegetative sequence that has been reconstructed from these profiles is outlined below. These changing paleo-environmental periods provided different habitats to which the prehistoric inhabitants of the reservoir area adapted. Spruce parkland, Jack Pine forests, oak savannas, and pine forests are habitats that present different subsistence-settlement opportunities for the state's early inhabitants. Understanding these changes is a necessary task in unraveling the processes that promoted sociocultural change and stability during this period.

Years Ago (B.P.)	Dominant Vegetation	Climate
1. c.1000-3000	Pine forest: white pine with a red and jack pine, birch, and alder mixture	cooler and moister (resembles the present climate)
2. c.3500-7700	Oak savanna: oak with grasses and sage in forest openings. Some patches of xeric deciduous forest with birch, alder, elm, and ironwood in small numbers.	warmer and drier; the Thermal Maximum occurs c.7000 B.P.
3. c.7700-10,000	Jack Pine forest: jack pine with birch, alder, elm, and oak.	warming climate and extinction of Pleistocene megafauna
4. c.10,000-12,000	Spruce parkland: spruce with birch, oak, elm, aspen, and sagebrush in park-like openings.	cool-moist; Pleistocene megafauna are present.

(The gradual retreat of the ice mass begins c.13,000 B.P., and Big Sandy Lake forms as remnant ice blocks melt c.12,000 B.P.)

The present vegetation of the Big Sandy Lake Reservoir area was

extensively documented during an environmental review of the six headwaters reservoirs in the state a decade ago (Center for Environmental Studies 1973). A number of factors have changed the composition of the natural pine forest climax vegetation that was present in the Big Sandy Lake Reservoir area in the early historic period. These include the supression of fires, logging, the construction of the reservoir, and lakeshore development. The supression of forest fires that followed white settlement in the area eventually produced a climax vegetation called a maple-basswood association; under normal conditions a natural pine-forest climax would develop following an extensive fire, since pine is better adapted to ground fires than shade tolerant trees such as basswood, fir, or maple. Logging had its most dramatic impact in the reservoir area along the eastern and southeastern sections of the shoreline; a secondary forest dominated by birch and aspen gradually developed in these areas as a natural succession leading to the maple-basswood climax.

The rise in the level of the water table of the Big Sandy Lake system that followed the construction of the dam that formed the reservoir inundated extensive areas of low lying land (see Map 2 attached to the backcover); although this event drastically disrupted archaeological sites, its effect on plant communities was less drastic, resulting mainly in the shift in location of some plant communities. Lakeshore development in recent years is increasingly altering the vegetation that borders the lake system; wooded areas are being cleared, new tree species are being introduced, and grassy lawns are being planted. An extensive review of the modern vegetation around the shores of the lake system is contained in the 1973 report by the Center for Environmental Studies. The reader should also be aware that the actual composition of the vegetation in any one area of the lake system is closely tied to local topographical conditions and the distance of its surface vegetation from the water table.

No background discussion of the environmental setting of present day archaeological sites within the Big Sandy Lake Reservoir would be complete without a description of the effects on these sites of the construction of the reservoir itself. Nearly all archaeological sites in the "North Woods" of Minnesota are situated adjacent to large bodies of water. The construction of the Big Sandy Lake Reservoir dam near the turn of the century raised the water of the reservoir lakes some 7 - 13 feet. The map attached to the backcover shows both the present and the past shoreline of the lake system before the construction of the dam. As this report will argue in the concluding chapter, the great majority of archaeological sites once situated around the edges of the lake system before the construction of the dam have been destroyed or extensively eroded. Wave action and the current of the Sandy and Prairie rivers continue to severely erode many of the remaining sites today. These destructive events must be taken into consideration in reconstructing the changing settlement patterns in the area.

A concise and informative introduction to the plant communities and wildlife of the "North Woods" of Minnesota can be found in Daniel and Sullivan (1981).

B. THE CULTURE HISTORY OF THE BIG SANDY LAKE AREA

Today, archaeologists have a sufficient understanding of the culture history of the Headwaters region in Minnesota and the broader Western Great Lakes area to construct a sequence of expected cultural periods for the Big Sandy Lake area (e.g., Hudak and Ready 1978; Johnson 1976). These periods provide a network of expectations against which the materials and sites discovered during a survey can be compared. A brief description of the seven major periods that have been defined for this region from earliest to most recent is given below. The emphasis in these descriptions is upon diagnostic features or artifacts such as ceramics or projectile points that aid the survey archaeologist in assigning sites to periods and/or archaeological complexes. Broader trends throughout the prehistoric period are also discussed, although survey data are generally inadequate to verify all of the details of these trends.

1. Terminal Glacial - Early Prehistoric Period (11,000-200 B.C.)

The earliest period of human occupation in the Headwaters region is the longest but also the poorest known of the seven periods in the region. Remains of "Big Game" hunters that roamed areas to the west and south of the Headwaters region seem absent in the region or at least very elusive during this cool-moist period when spruce parkland covered much of the region. A few prismatic blades found along the Rainy River in the far north of the state do suggest, however, that small numbers of early hunters may have lived in this terminal glacial environment, too (Stoltman 1871).

The succeeding "Early Archaic" phase coincided with the appearance of increasingly warmer and drier climatic conditions. This phase is still poorly known, too, although it is archaeologically more visible in the form of scattered projectile points than the preceding "Big Game" hunting phase. Possible "Early Archaic" settlement-subsistence patterns have been constructed for the Lake Itasca area by Shay (1971), and a distinctive Llano complex has been described for the Duluth Reservoir system and other areas to the north by Steinbring and Whelan (1971). The "Early Archaic" phase probably dates to 9,000 - 7,000 B.P. in the Headwaters region.

"Late Archaic" archaeological remains began to be deposited after the Thermal Maximum of c.7,000 B.P. Remains of this phase are more abundant in the Headwaters region than artifacts or sites from earlier phases. Complexes of this phase in the Headwaters region include the Fish Lake Dam Archaic and the White Oak Point complexes. Perhaps the most recognizable artifacts of these "Late Archaic" occupations are made of copper. Distinctive copper tools associated with this phase have been found at the White Oak Point site (Wilford 1955; Lugenbeal 1977), the Petaga Point site (Bleed 1969), along the Rainy Lake shoreline (Steinbring 1975), and within the basin of glacial Lake Agassiz (Johnson 1964). A few scattered copper tools have also been reported from the Big Sandy Lake area. Other diagnostic artifacts associated with

"Late Archaic" complexes include large stemmed and notched projectile points.

2. Middle Prehistoric Period (200 B.C. - A.D. 800)

Ceramics and earthern burial mounds first appear in the Headwaters region during the Middle Prehistoric period. The Big Sandy Lake area is situated between the homeland of the Laurel Tradition to the north (Stoltman 1973; Lugenbeal 1976) and the Malmo/Kern complex to the south (Wilford 1953). A small amount of Laurel pottery has been found around lakes Winnibigoshish and Leech in the Headwaters region. Laurel ceramics probably occur in equally small amounts in other areas of the region, for small amounts of this ware have been found as far south as the Anderson site (AN8) in Anoka County and the Calhoun Lake site (KH1) in Kandiyohi County (Anfinson 1979a:126). A small amount of Malmo/Kern pottery should also be expected in this region. Both Laurel and Malmo/Kern are associated with circular earthern mounds with secondary burials in shallow pits, charred log layers or cribs, and straight-stemmed, side-notched, and corner-notched projectile points. A brief description of Laurel ceramics can be found in Anderson (1979) and of Malmo/Kern ceramics in Caine (1979).

The most abundant Middle Prehistoric period ceramics in the Big Sandy Lake area should be Brainerd Ware and the St. Croix Stamped ceramic series. These ceramic complexes should be especially common during the c.A.D. 500 - 800 period. Brainerd Ware is divided into two distinctive types, Brainerd Net Impressed and Brainerd Horizontally Corded (Birk 1979a). The ware is commonly associated with earthern burial mounds and possibly with side-notched projectile points. The St. Croix Stamped series contains distinctive dentate stamped and comb stamped varieties (George 1979). St. Croix Stamped ceramics have also been found associated with earthern burial mounds, and with small side-notched and finely made isosceles triangular projectile points.

3. Late Prehistoric Period (A.D. 800 - 1640)

The Late Prehistoric period in the Headwaters region is associated with at least Onamia, Kathio, Blackduck, Sandy Lake, and some late simple and check stamped ceramics. Onamia ceramics occur during the transitional Middle-Late Prehistoric period of c.A.D. 800 - 1000 in central Minnesota (Ready 1979a). These ceramics are probably transitional too between earlier St. Croix Stamped and more recent Kathio ceramics in this region. Onamia ceramics are characterized by dentate and cordwrapped-stick-impressed decoration. Projectile points associated with these and the other ceramics of the Late Prehistoric period are primarily small side-notched forms and small triangular points. Kathio series ceramics (A.D. 800 - 1200) have short rims and fine cordwrapped-stick decoration (Ready 1979b).

The Late Prehistoric period in the Headwaters region is characterized by the intensified utilization of wild rice as a food staple.

The two major cultural complexes generally associated with intensified wild rice gathering in the region are Blackduck and Sandy Lake. Blackduck, the earliest of the complexes (c.A.D. 700 - 1200), is characterized by a distinctive ceramic style, triangular projectile points, small end scrapers, tubular stone pipes, and unilaterally-barbed bone and antler projectile points (Wilford 1941). Blackduck burials are usually primary pit-burials in circular earthen mounds. Ricing jigs occur at specialized ricing-activity sites. Compared with earlier regional archaeological complexes for which we have artifactual documentation, Blackduck is very extensive, having been found in the prairies of western Manitoba and eastward into Ontario and Wisconsin. Only early phase Blackduck ceramics (c.A.D. 700 - 1200) apparently occur in the Headwaters region in any abundance. A succinct description of Blackduck ceramics can be found in Lugenbeal (1979).

Blackduck complexes are succeeded by Sandy Lake complexes throughout most of the Headwaters region. Sandy Lake ceramics are easily distinguished from Blackduck; besides a difference in decorative style, many Sandy Lake vessels are tempered with shell. Sandy Lake ware is associated with what Douglas Birk (1977:31, 1979b) has called the Wanikan Culture. Characteristics of the Wanikan Culture also include conical burial mounds, small triangular projectile points, and ricing jigs or threshing pits. Besides cordmarked and plain varieties, there appear to be simple and check stamped varieties of Sandy Lake ware that may date to the late Late Prehistoric period. Many of the artifact types common on Blackduck sites also occur in Sandy Lake occupations. In fact, Sandy Lake components often occur at the same locations as Blackduck components. It is generally thought that the Sandy Lake complex is a prehistoric manifestation of a number of branches of the Dakota Indians, especially the Yanktonai Dakota and the Assiniboin (e.g., Lothson 1971). Sandy Lake complexes probably span the A.D. 1000 - 1750 time period.

A number of sociocultural and demographic trends seem to have occurred in the Headwaters region during the prehistoric time period. Since these trends have had an effect on what the survey archaeologist can expect to find in the Big Sandy Lake area, they are briefly discussed here. One trend has been a dramatic increase in the numbers of people who have lived in the region through time. Since more people lived in the area during the Late Prehistoric period, we can anticipate finding more Blackduck and Sandy Lake sites, for example, than Middle Prehistoric period sites.

There may also have been trends in the subsistence-settlement base from a concentration on a few food resources (especially megafauna) at an early period, to a concentration on a diversity of food resources, and a return again to a concentration on a few food resources (especially wild rice, fish, and deer) in the Late Prehistoric period. Since these were markedly different settlement-subsistence strategies, they should be reflected in the archaeological record in the distribution and content of archaeological sites. A useful but still tentative

framework for understanding these changes in the Headwaters region is to think in terms of a general shift from focal to diffuse to focal adaptations (Cleland 1977). Focal adaptations are highly specialized adaptive systems that are centered on one or a few similar reliable resources, while diffuse adaptations are based on the scheduled utilization of a great variety of resources. Although these are ideal types, actual adaptations can be easily classified into one or the other of these types. Each type, however, produces predictable patterns of resource exploitation that are expressed in characteristic settlement-subsistence systems and tool inventories. In focal adaptations site size, permanence, and function tend to be consistent; site utilization tends to be brief and intensive; the range of tasks at any one site is limited; and only a small number of tool kits is employed, although tool production may be prodigious. In diffuse adaptations there are usually a greater variety of tool kits, technological variability between sites is greater, there is a greater variability in the size of sites and in the intensity with which they were occupied, base camps or villages tend to be more common, and territorialism is promoted. Since territorialism increases intergroup variability within "territories," exchange systems tend to appear across boundaries; these systems lead to the rapid diffusion of materials and ideas.

The focal-diffuse distinction in adaptive pattern provides a useful classificatory system for ordering the prehistoric cultures that we anticipate finding in the Big Sandy Lake Reservoir area. Following Cleland (1977), four major patterns are proposed here. The first is an Early Focal pattern. This pattern includes those Paleo-Indian, Early Archaic, and Plano cultures that were adapted to the hunting of big game. In searching for sites belonging to this pattern, we should anticipate finding small sites containing an occupational debris which indicates an intensive preoccupation with capturing game and processing meat, hides, and bone; there should be a low degree of variability in site size and permanence, with sites providing evidence of an intensive occupation of a very limited duration. Tool kits should be limited in variety. This stable and successful focal adaptation was severely disrupted at the close of the Pleistocene by the substantial ecological changes that occurred following the withdrawal of the ice masses from the area and the replacement of the spruce parkland by the ecologically expansive Jack Pine forest.

A new Early Diffuse pattern gradually replaced the Early Focal pattern as the first readaptive response to post-Pleistocene conditions. This pattern equates with the Middle Archaic phase in many areas, and the expansion of Jack Pine forests into our study area. As during the earlier pattern, population density was still very low. However, we should anticipate finding an increased variability in tool form and function, new materials being used to manufacture tools, a proliferation of new styles, and increased variability among sites as multiple resources began to be exploited. A greater variability in site size, permanence, and function should reflect the complexities of resource scheduling in time and space in this pattern. We should also anticipate the initial establishment of territories. Al-

though this is a diffuse adaptive pattern, fewer resources were probably being exploited compared with the following pattern.

The succeeding Late Diffuse pattern witnessed the firm establishment of multiple resource scheduling and the continued specialization of these diffuse adaptations. In the Big Sandy Lake area archaeological complexes belonging to the Late Archaic (e.g., Old Copper) and the Middle Prehistoric period belong within this adaptive pattern. This new phase of adaptation contains the first appearance of pottery and burial mounds, and an increased territorialism which promoted differential production and exchange systems which moved resources across boundaries. The heightened demand for exchanged items and the regularization of the exchange systems may have promoted systems of status which are reflected archaeologically in the greater richness and diversity of burial ceremonialism which characterizes at least the latter phase of this time period. A greater variability in site function, site size, and differentiated artifact distributions at this time is typical of the complex multiple-resource base of these nonspecialized diffuse economies. Wild rice probably became an increasingly important food throughout the Late Diffuse pattern.

Finally, the Late Focal pattern in our area evolved around the development of an intensive wild rice harvesting subsistence base. Wild rice is a highly productive and storable grain capable of supporting a new focal adaptation. As mentioned above, people with Late Diffuse adaptations were probably preadapted for this development, since the requisite technology and social patterns necessary for gathering, processing, and storing wild rice grains were most likely an important element of their adaptations. It is not clear at the present time when this subtle reorientation to a focal economy occurred in the Headwaters region. This transition has generally been set at c.A.D. 800, although intensive wild rice harvesting seems to be best documented in our region for the Wanikan Culture. Until additional information becomes available, we will equate a Late Focal pattern with Late Prehistoric archaeological complexes as briefly described earlier.

A significant increase in population was either a result or a cause of these changes in adaptive equilibrium. Among the probable changes that characterize the Late Focal pattern in the Headwaters region are a decrease in technological and social variability, more regular and even conventionalized patterns of settlement, a greater proliferation of ceramic styles, a reduction in the size of territories and intergroup contacts and exchange, and an increased productivity of the new focal adaptation. Undoubtedly, specialized secondary resources such as fish and deer were being exploited and were an important part of the subsistence round. However, available information is still not sufficient to identify these resources and to assess their importance within the seasonal round.

It should be stressed in concluding this section that the focal-diffuse model is a heuristic that we have found useful in interpreting the prehistoric archaeological remains in the Big Sandy Lake Reservoir area. The merits of the model remain to be tested by continued site survey, as in this report, and by excavation.

4. Initial Historic Period (A.D. 1640 - 1750)

The Initial Historic period in the Headwaters region witnessed the first incursions of the French fur-traders and Algonkin-speaking Ojibwa Indians into the area. Although the evidence for this period is very skimpy throughout the region, a new economic system revolving around the fur-trade was initiated; an eventual result of this process was the replacement of many element of the native life-way by new social systems and by goods manufactured by the French.

5. Fur Trade Period (A.D. 1750 - 1800)

The florescence of the fur trade occurred during this period, and the final displacement of the Dakota by the Ojibwa. The fur-trade was dominated by the British throughout most of the period, and posts of the Hudson Bay, Northwest Company, and other firms were established.

6. Intensive Resource Use Period (A.D. 1800 - 1920)

This period saw major changes throughout the Headwaters region. Anglo-Americans entered the region to log-off the conifers. Dams were constructed and lake levels raised. Small farming homesteads were established, and the native populations were gradually moved to reservations. Villages, towns, and railways were also constructed.

7. Recent Period (A.D. 1920 to the present)

The occupation of the Big Sandy Lake area changed in character after 1920. Many homesteads were gradually abandoned due to the poor soils and short growing season of the area, and logging ceased as a major activity. The resulting economic void was rapidly filled by the recreation industry which focused upon summer fishing. Resorts and summer residences remain the major economic force in the area today.

C. Previous Investigations

Investigations of the Big Sandy Lake Reservoir area by professional archaeologists have been very limited. Until 1977, most of the available information for the area had resulted from occasional brief surveys by Lloyd Wilford and Leland Cooper. However, extensive collections of artifactual material were made between c.1920 and 1960 by local residents and summer visitors. Among these collections are those of Mr. and Mrs. Eugene Grolla, Mr. and Mrs. William Russ, and Mr. Frank Zinc. Mr. Zinc also excavated a portion of a fur post (21 AK 4) on Brown's Point under the aegis of the Minnesota Historical Society. Most of the material recovered during this excavation is now on display in the Big Sandy Lake dam facility museum or in storage at Fort Snelling in the Archaeology Department. By 1977, six sites (21 AK 4, AK 6 - 9, and AK 11) were listed in files of the State Archaeologist.

This list was composed of the fur-trading post, an historic Ojibwa village site with an associated cemetery, and prehistoric earthen burial mounds. One of the major Late Prehistoric period ceramic types in the Headwaters region, Sandy Lake ware, was defined in part on the basis of a study by Elden Johnson and Leland Cooper (1964) of collections from the Miner's Point site (21 AK 18) near Big Sandy Lake.

Professional archaeological activity in the Big Sandy Lake Reservoir area has increased in the 1970s and 1980s. An interdisciplinary study of the Headwaters region was conducted in 1973 by the Center for Environmental Studies at Bemidji State University. Archaeologists visited Big Sandy Lake during this study, examining recorded sites and private collections. The results of this study are summarized in Environmental Review of the Headwaters of the Mississippi Reservoir Projects, a report submitted to the St. Paul District of the U.S. Army Corps of Engineers in 1973. The first professional excavations in the reservoir area were conducted by Charles Watrall for the Minnesota Historical Society on Battle Island (21 AK 9) in 1969 (Watrall 1969). Watrall found Sandy Lake sites and early historic Dakota sites on Battle Island and Brown's Point; the affinities of the latter sites seem to be with the Dakota who lived at Kathio before 1730 (Woolworth 1969). Watrall also investigated the historic Ojibwa cemetery at the north end of Big Sandy Lake, and found evidence of historic Ojibwa camps on Brown's Point, on the north side of Sandy Lake, on the park road to Shumway Lake, on the south-east corner of the junction of the Sandy Lake River and the Mississippi River, and one-half mile from the west end of the Savanna Portage. Several reports of the accidental discovery of "Old Copper" projectile points around Big Sandy Lake were also recorded by Watrall.

More extensive excavations were conducted in the summer of 1975 by a University of Minnesota archaeological field school under the direction of Professor Elden Johnson; five test units were excavated at 21 AK 11, the Big Sandy Lake dam site.

The first modern large scale archaeological survey of the Big Sandy Lake shoreline was conducted in 1977 by G. Joseph Hudak and Tim Ready of the Science Museum of Minnesota for the U.S. Army Corps of Engineers (Hudak and Ready 1978). This was not the first reported survey, however, for Jacob V. Brower had found mounds around Big Sandy Lake and along the Sandy River in 1894 (Brower 1898), and six prehistoric habitation sites around 1900 (Brower 1901). These latter sites were at the outlet and inlet of Big Sandy Lake; near the mouth of the West Savanna River; at Section 16, Township 49, Range 23; at the west side of Davis Lake; and at the head of the Sandy River, south of Tamarac. Some of the mound groups discovered by Brower were recorded on a map made by Evan Hart in 1964 (Hart 1964). Nonetheless, the Hudak and Ready survey was the first to examine large sections of the shoreline using modern survey techniques. Thirty-five archaeological sites were documented and evaluated during this survey which examined approximately one-half of the modern shoreline of Big Sandy Lake (see Map 2 attached to the backcover). Hudak and Ready developed a cultural historical framework for the area,assessed the potential of site des-

truction, and recommended intensive testing and/or mitigation for threatened sites. The survey reported here, as mentioned earlier, should be viewed as a continuation and companion of the Hudak and Ready survey. The map attached to the backcover of this report is based on a map in the Hudak and Ready report; this map shows the extent of both the Hudak and Ready survey, and the 1982 survey reported here.

A five-week University of Minnesota summer field school under the direction of the senior author of this report excavated portions of the Indian Mound Point site (21 AK 7) and the Battle Island site (21 AK 9) in 1981, as well as a portion of the western-most "pause" along the Savanna Portage in nearby Savanna Portage State Park. This material is now being prepared for publication. An archaeological survey of the portage was begun in the summer of 1982 and continued throughout the summer of 1983. An extensive review of the historic documentation of the use of the portage can be found in Woolworth (1969). Several small-scale investigations of potential site areas were also conducted in the summer of 1982. A field crew from St. Cloud State University tested the "Twin Islands" site, and the author surveyed Blarney Island. Both of these reports are on file with the State Archaeologist of Minnesota.

5. THEORETICAL AND METHODOLOGICAL OVERVIEW

A statement of the goals and rationale of the Corps of Engineers in supporting this cultural resources investigation of the Big Sandy Reservoir is contained in the introduction to the scope of work appended to this report. Relevant sections are reprinted below:

"This cultural resources inventory is being done in partial fulfillment of the obligations of the St. Paul District regarding cultural resources, as set forth in the Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), the National Environmental Policy Act of 1969 (P.L. 91-190), Executive Order (E.O.) -1593 for the Protection and Enhancement of the Cultural Environment (Federal Register, 13 May 1971), and the Archaeological Conservation Act of 1974 (P.L. 93-291), the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR Part 800), the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60), and Corps of Engineers regulations (ER 1105-2-460) "Identification and Administration of Cultural Resources" (Federal Register, 3 April 1978).

"The above laws establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in P.L. 93-291 and E.O. 11593, are being taken by the Corps "... to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

"The Executive Order further directs Federal agencies "...to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans and programs in such a way that federally and non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved and maintained for the inspiration and benefit of the people.

"This cultural resources investigation will serve several purposes. The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only partially fulfills federally mandated legal requirements but also serves as a scientific reference for future professional studies. It will identify sites which may require additional investigations and which may have potential for public-use development. Therefore, the report must be analytical, not

just descriptive."

The ultimate goal of the study researcher is the description and explanation of the similarities and differences of the cultural resources in the Big Sandy Reservoir system. Within the framework of this broader objective, this survey complements that of Hudak and Ready by making us aware of the present distribution and nature of cultural resources in the area. Since this is a phase one survey, the kinds of cultural resource information gathered are limited to statements about the presence of sites and their general characteristics (e.g., depth, size, range of materials present). Information regarding the spatial association of artifacts or the "structure" of a site that is the result of more extensive excavation is necessarily excluded from this project. However, a Phase one cultural resources survey generally results in data adequate to assess the general nature of all sites present; a recommendation for additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information; and detailed time and cost estimates for Phase two testing.

The theoretical orientation of this study was described in the preceding chapter. A major goal of this orientation was the eventual identification of the functions of components of sites within complex adaptive focal or diffuse settlement-subsistence systems. Although it is still too premature to reconstruct these systems in detail, the search strategies adopted were developed to contribute to this objective. These strategies were carried out within a geographic area mandated by the Scope of Work of this project. That is, the Phase one cultural resource survey was mandated to include those lands along the shoreline of Big Sandy, including all islands, not previously surveyed; the shoreline of Aitkin Lake (approximately 13 miles - if time and funds allowed); all lands within 50 meters of the water's edge in these areas or, in those areas of shoreline with evidence of erosion, all lands from the water's edge to 50 meters inland from the edge of the eroded bank; all islands not previously investigated in their entirety. In addition two known sites (21 AK 28 and 21 AK 29) and 19 unverified find spots were to be field checked to determine their site type and condition - or at least the reality of their existence. However, within these constraints, the project attempted to adopt procedures that would locate all habitation sites, determine their size if possible, recover as complete a range of artifacts from each site as possible, and establish the presence or absence of subsistence refuse such as bones and carbonized seeds.

The following chapter describes the field procedures adopted to fulfill these goals, including shovel-testing, the collection of all visible portable cultural materials, and the recording of site location and size.

6. FIELD METHODS

The 1982 cultural resources reconnaissance of the shoreline of Big Sandy Reservoir was conducted by Terri Liestman (field director), Susan McCanna, Gary Staupe, and Eugene Willms between June 12 and July 4, 1982. McCanna, Staupe, and Willms were members of the 1981 University of Minnesota field school held at Big Sandy Lake and were, therefore, quite familiar with the area. Liestman has had extensive experience as an archaeologist and is now employed as an archaeologist by the national parks system. The crew, which traveled as a team in a boat, began the survey by examining those areas of Big Sandy not examined by Hudak and Ready; they then examined as much shoreline along other lakes in the reservoir system as time and finances permitted. The areas around Big Sandy Lake surveyed by Hudak and Ready, and all shoreline areas examined by the 1982 crew, are indicated on Map 2 attached to the inside of the backcover of this report.

The weather during the survey was very good; that is, there was extensive rain only during part of one week. Unlike the Hudak-Ready survey, then, survey conditions were not hindered by excessive rain or other natural conditions. However, the waterline was fairly high during the survey, which made access to marshy areas very difficult. These areas, we must remember, would have been part of the low-lying beach system that bordered the lake system before construction of the dam. The extent of the inundation of this beach system is indicated in Map 2. In some instances the extent of inundation is startling large. For example, only one-quarter of Battle Island is now above water. As will be mentioned in the conclusions to this report, surveys during the early spring and late fall when the water level is often at its lowest might lead to the discovery of additional sites or site areas that have been inundated by the raise in water level following the construction of the dam.

Permission to survey was asked of all landowners whenever possible. An article was also placed in a local newspaper that informed the residents of the region of the purpose of the survey. Since three of the crew members had worked within the reservoir system the previous summer, they were a familiar sight on the water and along the shoreline. The survey crew examined an area within 50 meters of the present shoreline (as defined by the water level during the survey period in 1982) or to the 1225 foot contour. All of the exposed surfaces of the survey areas visited were visually examined for artifacts or cultural features, such as mounds, ricing jigs,house basins, and standing houses that might pre-date 1900 or have other cultural significance. Systematic shovel-testing was used in all areas back from the immediate shoreline; as a standard procedure 15 meter intervals were maintained and tests were made every 8 to 10 meters. However, shovel-tests were made in addition in any area that appeared potentially interesting to the field archaeologist. This might be, for example, an unusual depression or rise, or a flat elevated area that might have been a good camping ground. All artifacts found on the exposed surface of the survey area

were collected. When artifacts were found in shovel-test pits, additional closely spaced pits were dug to determine the extent of distribution of the site. All cultural material found in shovel-test pits was also collected. All of the artifacts collected during the survey were subsequently washed and accessioned in the Wilford Laboratory of Archaeology of the Department of Anthropology at the University of Minnesota, Minneapolis, where they are now stored.

Since the 1982 survey was a cultural resources reconnaissance or Phase 1 survey designed to cover a very large extent of shoreline, the standard shovel-test pit was one-by-one foot rather than some larger unit. All shovel-tests were taken down to a depth of at least 1.5 feet and their contents screened through ¼ inch mesh. Because of the light color of the sand in this area, artifacts were very visible in the soil. Although shovel-testing is a standard technique in modern-day archaeological surveys, it is not a sufficient procedure for locating deeply buried materials of great age. Archaic artifacts, for example, have been found at a depth of 10 feet or more during the construction of house cellars in the Big Sandy Lake area. Shifting and blowing sand has, therefore, probably buried quite deeply many of the earliest archaeological sites in the area. Archaeologists attempt to locate such deeply buried sites routinely by cut bank profiling, but no inexpensive procedure has been devised yet for the detection of such sites. The inexpensive detection of deeply buried sites remains a major problem in archaeology today, a problem that might be solved in the near future by the development of modestly priced ground-penetrating radar equipment or similar devices.

Following the completion of the Big Sandy Lake survey, additional areas in Aitkin, Sandy River, and Flowage lakes were examined using the same procedures. As Map 2 indicates, some areas in these lakes could not be surveyed b ecause of extensive marsh bordering the present shoreline. In most cases this marshy growth extended at least 200 feet from the shore. Since the water-level of the reservoir has been raised considerably by the construction of the dam at the lake system outlet, sites within a strip at least 60 meters wide from the natural shoreline would now be underwater in these marshy areas. The areas surveyed in these smaller lakes are also marked on Map 2 on the inside of the backcover. Since the entire shoreline of these smaller lakes could not be surveyed (because of financial restrictions), those areas were chosen that would have been closest to the natural shoreline and/or appeared to be from past experience good habitation locations (e.g., a flat elevated area).

Local collectors and residents were interviewed throughout the survey. In fact a hazard of archaeological survey in densely populated areas like the shoreline of Big Sandy Lake is the loss of survey time that can result through conversations with local residents. The practice of assigning one crew member as "talker" and note-taker was adopted during the 1982 survey; this permitted other crew members to proceed with the ground search. The names of local informants and their address (when it was possible to obtain it) are included in the site forms in the following chapter. The existence of local collections is noted too.

7. SITE DESCRIPTIONS, EVALUATIONS, AND RECOMMENDATIONS

A total of 15 new sites or find-spots were found during the 1982 reconnaissance of the Big Sandy Lake Reservoir shoreline. Since there has been extensive site destruction in the reservoir following the construction of the dam, a large amount of material has been redeposited through wave action on the present shoreline. This material was particularly abundant during the 1920s and 1930s. It has decreased in abundance since that time as collectors have combed the shoreline. A site by definition is a geographical locus of artifacts and features such as ricing-jigs. Many of these collecting spots are sites in this sense, for they are at least a geographical locus of artifacts even though they are composed of secondary, redeposited material. In addition, the labeling of geographical loci where archaeological material has been found as a site warrenting an official state site number or as a "find-spot" is a convention of the Office of the State Archaeologist of Minnesota. This office makes the final determination as to whether one of these officially reported geographical loci should be labeled a site or a find-spot. For these reasons, the "sites" found during the 1982 survey are introduced in this section by field number. A determination is then made whether they are a primary or secondary "site,"or an official site or a find-spot. Since the term "site" is generally used (and is so used here in many sections) to refer to any geographical locus where artifactual materials and/or features have been found, the restricted sense in which the term is used by the State Archaeologist's Office may cause some confusion. However, if one can remember that the term "site" is generally used to refer to the abstract idea of any geographical locus where artifactual material and/or features have been found, and that in Minnesota officially reported "sites" are categorized as either a site or a find-spot, confusion can be kept to a minimum. Although the criteria which are used to differentiate between sites and find-spots are not entirely clear, it seems that find-spots refer to geographical loci with only a few artifacts and no signs of actual habitation such as an ash lense or, perhaps, of significant stratigraphic separation.

The field numbers used in this report are continuations of the sequence initiated by the Hudak and Ready survey. These numbers are printed in Map 2 within squares. Several additional site areas or potential site areas were also examined during the survey. These areas are also discussed in this section.

Besides the field number, the state number, site name, owner, location, site type, probably cultural components, site description, site condition, current land use, size of site area, nature of nearest water, distance to water, direction of site from water, site elevation, elevation of nearest water, nature of investigation, artifacts observed, local informants or collectors, written references, repository, and other information are recorded on official Minnesota archaeological site forms. Recommendations are also made in the discussion of each site concerning the manner in which the site should be treated in the near future.

Field Number 41

State Site Number 21 AK FS3 (Note: FS refers to "find-spot)

Location: The find-spot is on the northwest side of the sandy peninsula that forms the northern shore of Belhorn Bay. It is in the S½ of the NW¼ of the NW¼ of Section 9, T 49 N., R 23 W of the Libby Quadrangle.

Description: Three artifacts (2 grit tempered plain bodysherds and 1 lithic core) were found scattered within a 30 meter area of a narrow sandy beach that only extended about 3 meters back from the water's edge. A willow stand and other undergrowth borders the backside of this beach. The find-spot is along the frontage of a privately owned wooded lot and is not in immediate danger of erosion. Permission to shovel-test was not given, so this potential site area was only surface collected. Nonetheless, no signs of habitation in the form of features or concentrations of artifacts were found. A basalt celt was found in this area by Clyde N. Johnson in about 1963. The find-spot is around a bend in the peninsula from 21 AK 15.

Cultural Affliations: Undesignated Woodland.

Collections: U of M survey 1982

U of M Accession Nos.: 887-4-1, 887-7-1

Cultural Material: Two grit tempered plain bodysherds and 1 lithic core. A basalt celt was found circa 1963 by Clyde N. Johnson in the same area.

Discussion and Recommendations: Since this find-spot is not threatened by erosion at the present time, no immediate action is suggested. However, an attempt should be made when possible to shovel-test the find-spot. It is possible that this find-spot represents a secondary deposit from a once disturbed primary site now under water. Shovel-testing should resolve this question, as well as determine the subsurface extent of cultural material.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	41	21-AK-FS3

OWNER
Unknown

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Northwest side of sandy peninsula extending into Big Sandy Lake and forming northern shore of Belhorn Bay.

LEGAL DESCRIPTION
S½, NW¼, NW¼ Sec. 9 T49, R23, Libby

SITE TYPE
Indeterminate

PROBABLE CULTURAL COMPONENTS:
Middle or Late Woodland

SITE DESCRIPTION
Narrow sandy beach about 3 meters from water, succeeded by small willow stand and undergrowth, currently undeveloped.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Frontage of wooded lot, private property,	30 m. along shoreline. (NE to SW)

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Big Sandy Lake	Shoreline	South

ELEVATION OF SITE: 1220 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey, permission to subsurface test not obtainable.

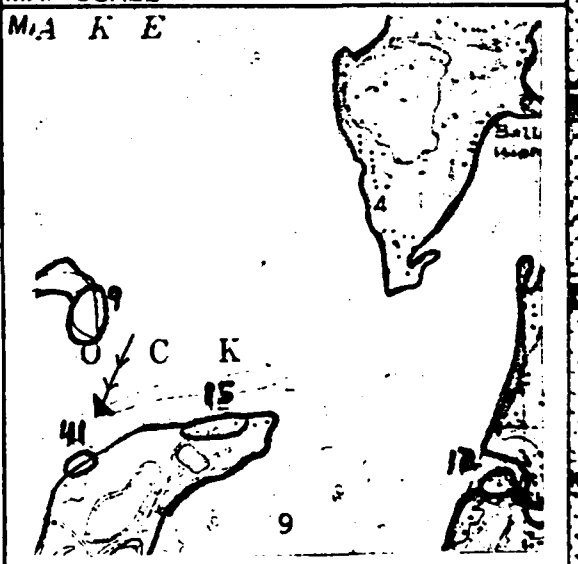
ARTIFACTS OBSERVED, RECOVERED:
2 grit tempered plain body sherds
1 lithic core

LOCAL COLLECTIONS, INFORMANTS:
Clyde N. Johnson (found basalt celt in this area circa 1963)
Rte 4 - Box 53
McGregor, MN 55460

WRITTEN REFERENCES
None

COMMENTS:
Scattered artifacts very near to shore, no conclusive signs of habitation. Near to known site 21-AK-15.

MAP SCALE:



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
887-4 -1 887-7 -1	None	Univ. of Minn. PROJECT: 1982 Survey	Liestman/crew DATE: 6/14/82

Field Number 42

State Site Number 21 AK FS4

Location: The find-spot is in Davis Bay about 400 meters due east of Kare Phree Pines Resort. The legal description is the NW¼ of the NW¼ of the NE¼ of Section 20, T 49 N., R 23 W of the Minnewawa 7.5' Quadrangle.

Description: Although no artifacts were found by the survey crew at this find-spot, 15 - 20 stones measuring approximately 10-20 cm. in diameter are arranged in a rectangular shape 3.3 meters long and 90 cm. wide. This potential post-contact burial is situated on a ridge covered by trees and dense underbrush. Permission was not granted for shovel-testing in the area. Several projectile points and a possible ground stone implement were found near the resort and are now in the possession of the resort owner, Marian Stringham.

Cultural Affliation: If the pile of stones does represent a burial, this find-spot most probably represents a post-contact burial site.

Collections: Two projectile points and a ground stone implement in the possession of Marian Stringham, owner of Kare Phree Pines Resort.

Discussion and Recommendations: This find-spot is not threatened by erosion or other disturbance at the present time. However, it is not certain that this covering of stones does represent a site by any name. This can only be determined by testing in the future. This potential site should be protected until this determination is made.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	42	21-AK-FS4

OWNER Marian Stringham
Kare Phree Pines Resort
McGregor, MN 55460

U.S.G.S. QUAD
Minnewawa 7.5' - 1970

SITE LOCATION
On Davis Bay about 400 m due east of Kare Phree Pines Resort.

LEGAL DESCRIPTION
NW¼, NW¼, NE¼ Sec 20 T49, R23 (Minnewawa)

SITE TYPE
Unidentified Feature

PROBABLE CULTURAL COMPONENTS:
Historic ?

SITE DESCRIPTION
15-20 stones measuring approx. 10-20 cm. in diameter, in a rectangular shape, 3.32 m long by 90 cm wide. On a ridge, elm/ash/oak forest and dense underbrush.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Private commercial property (resort grounds).	Less than 10 sq. m.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Big Sandy Lake	30 meters	South

ELEVATION OF SITE: 1250

ELEVATION OF NEAREST WATER: 1216

NATURE, EXTENT OF INVESTIGATION: Surface, owner withheld permission to shovel test.

ARTIFACTS OBSERVED, RECOVERED:
None recovered, see description above.

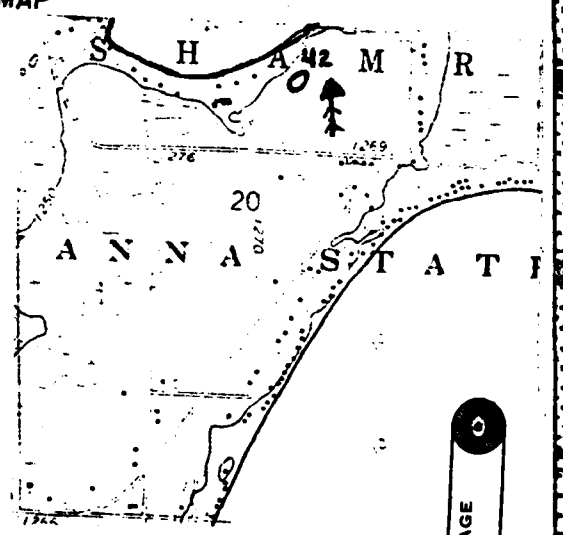
LOCAL COLLECTIONS, INFORMANTS:
Marian Stringham (collection of two points, one ground stone implement found near resort)

WRITTEN REFERENCES
None

COMMENTS:
This pile of stones could represent a post-contact burial. This potential site should be protected until this determination can be made.

MAP SCALE:

MAP



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
None	None	Univ. of Minn.	Liestman/Crew
		PROJECT: 1982 Survey	DATE: 6/15/82

PREVIOUS PAGE IS BLANK

Field Number 43

State Site Number 21 AK FS5

Location: This find-spot is on the southeast tip of Long Island in the NW¼ of the SW¼ of the SE¼ of Section 5, T 49 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: A small number of artifacts were found along the shore of a wooded lot that is under development. The clay and sandy soil is heavily disturbed by excavations for a sewer line, although the find-spot itself is not presently subject to erosion. The artifacts were found about 25 meters back from the water's edge in shovel-test pits. No collections are known from the find-spot. It is possible that this find-spot is a continuation of a long-term habitation area that surrounded much of the peninsula, for 21 AK 22, 21 AK 23, and 21 AK 24 are all nearby.

Cultural Affliation: Middle Woodland

Collections: U of M survey 1982

U of M Accession Nos.: 888-3-2, 888-4-2, 888-5-2

Cultural Material: Three grit tempered bodysherds (one comb impressed and two net-impressed) and 1 chert flake.

Discussion and Recommendations: This find-spot may represent a heavily disturbed campsite. Since the density of artifacts is low, we do not regard it as a major occupation center. However, it is a concentration of Middle Woodland material and it should be closely examined for additional materials whenever possible. It is not subject to erosion and - if it escapes destruction during the development of the lot -it could add to our knowledge of Middle Woodland occupations in the Big Sandy area. Since it is located some distance back from the edge of the shoreline, it could represent one of the few undisturbed (at least in part) Middle Woodland sites in the area. This find-spot probably deserves a phase two survey that involves limited excavation; a phase two survey would also alert the present landowners to areas of their lot that should not be disturbed.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	43	21-AK-FS5

OWNER Jongvard

U.S.G.S. QUAD Libby 7.5' - 1970

SITE LOCATION
Point of land of the Southeast tip of Long Island.

LEGAL DESCRIPTION
NW¼, SW¼, SE¼ Sec 5 T49, R23 (Libby)

SITE TYPE Indeterminate

PROBABLE CULTURAL COMPONENTS: Middle Woodland

SITE DESCRIPTION
Wooded lots under development, heavily disturbed clay and sandy soil.

SITE CONDITION	CURRENT LAND USE	SITE AREA
Heavily developed much sewer excavation, Little erosion	Residential	Undesignated.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Big Sandy Lake	25 meters	Northeast

ELEVATION OF SITE: 1225 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
3 grit tempered body sherds (One comb impressed, two net impressed)
1 lithic flake (chert)

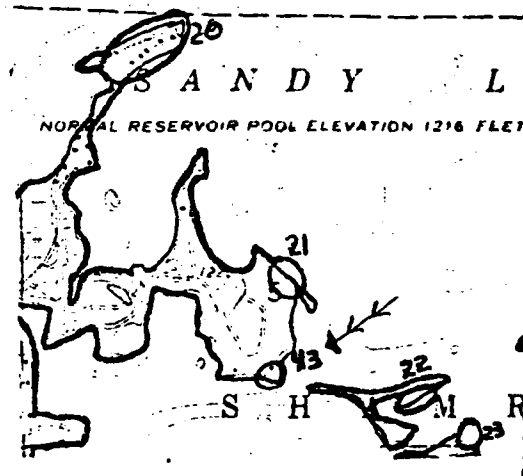
LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
Found in shovel tests, near to sites 21-AK-22, 21-AK-23, and 21-AK-24.

MAP SCALE:

MAP



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
888-3-2 888-4-2 888-5-2	None	Univ. of Min PROJECT: 1982 Survey	Liestman/Crew DATE: 6/17/82

PREVIOUS PAGE IS BLANK

Field Number 44

State Site Number 21 AK 43

Location: This historic ricing site is on a small island directly south of the Aitken Lake Resort in the southwestern section of Aitken Lake. It is in the NW¼ of the SW¼ of the SE¼ of Section 19, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: This is a small island covered with a dense layer of brush and trees. At least 13 depressions measuring 95 cm. to 1.5 meters in diameter were concentrated along 80 meters of shoreline on the south end of the island. The depressions are located in a band stretching from the shoreline back some 50 meters. The island is privately owned and has no development potential at the moment. There is no immediate danger of erosion. The entire island was shovel-tested. An informant stated that Ojibwa have riced and camped here as recently as 30 years ago. However, no artifacts were found by the survey crew.

Cultural Affliation: Historic Ojibwa (this determination is based on the size and location of the pits, and on an informant's information. Although a systematic survey of the cultural affliations of ricing jigs in Minnesota has never been made to my knowledge, jigs associated with historic Dakota sites near Mille Lacs Lake are much smaller and lined with clay. The cultural affliation of this site must remain, therefore, tentative.)

Collections: None

Cultural Materials: No artifacts were found during the survey. The only indication of a cultural presence is the ricing jigs.

Discussion and Recommendations: Ricing jigs are a common occurrence on the shorelines of many lakes in this area of Minnesota. We have never found artifacts in direct association with jigs unless the jigs are within a habitation site. Since this site is not threatened by immediate destruction, no immediate action is suggested.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	44	21-AK-43

OWNER
Jim Aldrich
Aitken Lk. Resort, McGregor MN 55460

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Island directly south of resort in southwest part of Aitken Lake.

LEGAL DESCRIPTION
NW¼, SW¼, SE¼ Sec 19 T50, R23 (Libby)

SITE TYPE
Ricing site/Camping place

PROBABLE CULTURAL COMPONENTS:
Historic

SITE DESCRIPTION
Small densely covered island with at least 13 depressions measuring from 95 cm. to 1.5 meters in diameter, concentrated primarily on southeast end.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Privately owned, no development potential.	80 meters of shoreline on South end.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Shore to 50 meters	Northwest

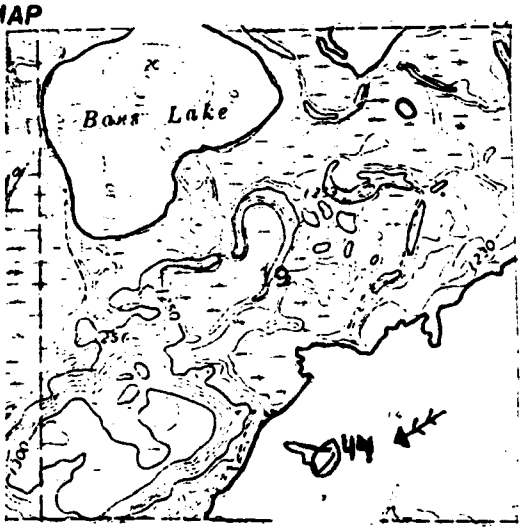
ELEVATION OF SITE: 1225 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
None recovered

MAP SCALE:

MAP



LOCAL COLLECTIONS, INFORMANTS:
Jim Aldrich

WRITTEN REFERENCES
None

COMMENTS:
Informant says Ojibwa's have riced and camped here as recently as 30 years ago.

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
None	None	Univ. of Minn.	Liestman/Crew
		PROJECT: 1982 Survey	DATE: 6/18/82

Field Number 45

State Site Number 21 AK 44

Location: This site is located on a point of land that extends eastward from the northwest shore of Aitken Lake. It is in the SW¼ of the SW¼ of the NW¼ of Section 20, T 50 N., R 23 W. of the Libby 7.5' Quadrangle. The site is between the shoreline and a line about 10 meters parallel to the shore.

Description: This site stretches along the shoreline of an undeveloped point of land for less than 200 meters. The point is presently surrounded by marsh and wild rice stands. Although shovel-testing was employed, artifacts were only found within a distance of no more than 10 meters from the shoreline. The site appears to have been a small Late Woodland campsite. No features were discovered in shovel-tests. At the present time, the site is not in danger of erosion.

Cultural Affliations: Late Woodland (Blackduck)

Collections: U of M survey 1982

U of M Accession Nos.: 889-4-2, 889-5-2, 889-8-2, 889-6-2, 889-4-1

Cultural Material: Thirteen cord-marked bodysherds, 2 lithic waste flakes, 1 fish scale, 2 burnt bone fragments (one of which may be a burnt human medial phalange).

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. It is possible that this site represents a secondary deposit of cultural material, having been redeposited by wave action following the construction of the Sandy Lake Reservoir dam. This possibility could be evaluated by a phase two survey when the opportunity arises in the future.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	45	21-AK-44

OWNER Jim Aldrich
Aitken Lk Resort
McGregor, MN 55460

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Point of land extending eastward from the Northwest shore of Aitken Lake.

LEGAL DESCRIPTION
SW¼, SW¼, NW¼ Sec 20
T50, R23 (Libby)

SITE TYPE
Indeterminant

PROBABLE CULTURAL COMPONENTS:
Late Woodland (Blackduck)

SITE DESCRIPTION
Mixed deciduous shoreline, undeveloped point of land surrounded on sides by marsh and wild rice stands. Brown loamy and mixed sandy loam soil.

SITE CONDITION	CURRENT LAND USE	SITE AREA
In no immediate danger of erosion.	Undeveloped	Less than 200 m along shore in northeasterly direction.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Shoreline to 10 meters.	West

ELEVATION OF SITE: 1230

ELEVATION OF NEAREST WATER: 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and sub-surface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
13 cord marked body sherds
2 lithic waste flakes
1 fish scale
2 burnt bone fragments (one possibly human - medial phalange)

LOCAL COLLECTIONS, INFORMANTS:
Jim Aldrich

WRITTEN REFERENCES
None

COMMENTS:

MAP SCALE:

MAP

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
889-4-2 889-5-2 889-8-2 889-6-2 889-4-1	None	Univ. of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/18/82

Field Number 46

State Site Number 21 AK 45

Location: This site is on a point of land that extends eastward from the northwest shore of Aitken Lake. It is in the SE¼ of the NW¼ of the NW¼ of Section 20, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: The site stretches 200 meters on either side of a partly cleared, narrow point of land in Aitkin Lake. The area, although undeveloped, is cleared and used by a local snowmobile club. The banks along the edge of the site are undergoing moderate erosion. At present the area is owned by Jim Aldrich, the owner of Aitken Lake Resort.

Cultural Affliations: Late Woodland (Sandy Lake)

Collections: U of M survey 1982

U of M Accession Nos.: 890-3-1, 890-5-1, 890-6-2, 890-3-2, 890-4-2, 890-5-2

Cultural Material: Seven plain bodysherds, 7 cord-marked bodysherds, 6 smoothed-over cord-marked bodysherds, 1 fabric impressed bodysherd, 9 exfoliated sherds, 3 chert flakes, 1 bone fragment.

Discussion and Recommendations: This was the most promising site found during the 1982 survey in terms of density of artifacts in an undisturbed context. Since the shoreline edge of the site is experiencing moderate erosion, it should be checked occasionally to prevent any extensive damage.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	46	21-AK-45

OWNER
Jim Aldrich
Aitken Lake Resort
McGregor, MN 55460

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Point of land extending eastward from the Northwest shore of Aitken Lake.

LEGAL DESCRIPTION
SE¼, NW¼, NW¼ Sec 20
R23, T50 (Libby)

SITE TYPE
Indeterminate

PROBABLE CULTURAL COMPONENTS:
Late Woodland (Sandy Lake Ware)

SITE DESCRIPTION
Partly cleared, narrow point of land, mostly pine forest on small ridge of land, between lake shore and meandering creek 50 meters inland.

SITE CONDITION	CURRENT LAND USE	SITE AREA
Banks undergoing moderate erosion.	Undeveloped, used and cleared by local snowmobile club.	200 meters on either side of point.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Shoreline	West

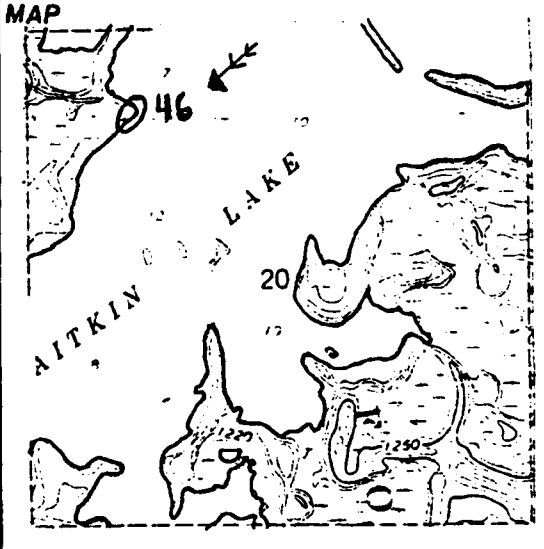
ELEVATION OF SITE: 1225 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
7 plain body sherds
7 cordmarked body sherds
6 smoothed-over cord marked body sherds
1 fabric impressed body sherd
9 exfoliated sherds
3 waste flakes
1 bone fragment

MAP SCALE:

MAP



LOCAL COLLECTIONS, INFORMANTS:
Jim Aldrich

WRITTEN REFERENCES
None

COMMENTS:
Most promising in terms of artifacts located in a relatively small area.

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
890-3-1 890-6-2 890-4-1 890-3-2 890-5-1 890-4-2 890-5-2	None	Univ. of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/18/82

Field Number 47

State Site Number 21 AK 46

Location: The site is situated on a point of land that extends southeast into Muck's Bay in the northernmost section of Aitken Lake. It is in the NE¼ of the SW¼ of the SE¼ of Section 17, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: The site is on a high ridge that extends out into Aitkin Lake. Pine and mixed hardwoods now cover the ridge; a wild rice stand occurs immediately to the west. The site itself is surrounded by water on all sides except the northwest. At the present time the peninsula on which the site is located is undeveloped and in no immediate danger of erosion. Sherds were found scattered along the shoreline about 100 meters on either side of the point. No artifacts were found in shovel-tests, which may indicate that the sherds found could have been redeposited along the shore by wave action.

Cultural Affliations: Late Woodland

Collections: U of M survey 1982

U of M Accession Nos.: 891-4-2

Cultural Material: Nineteen plain grit-tempered bodysherds

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. As mentioned above, this site could represent a secondary deposit eroded from a primary site now submerged under Aitken Lake. Even though no artifacts were found by shovel-testing, the site should be checked again in the future for artifacts that may be occasionally deposited along the shoreline.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	47	21-AK-46

OWNER
Catholic Church

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Point of land extending southeast into Muck's Bay on northernmost part of Aitken Lake

LEGAL DESCRIPTION
NE¼, SW¼, SE¼ Sec 17 T50, R23 (Libby)

SITE TYPE
Indeterminate(occupation?)

PROBABLE CULTURAL COMPONENTS:
Late woodland

SITE DESCRIPTION
High ridge of land extending out on point, pine/mixed hardwood surrounded by wild rice to the west.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Undeveloped	100 m. on either side of point.

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Shoreline	Surrounded on all sides but Northwest.

ELEVATION OF SITE: 1251 **ELEVATION OF NEAREST WATER:** 1216

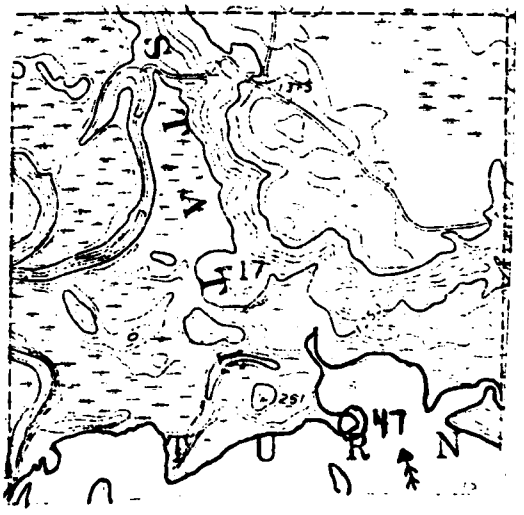
NATURE, EXTENT OF INVESTIGATION: Surface survey and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
19 plain body sherds

MAP SCALE:

LOCAL COLLECTIONS, INFORMANTS:
None

MAP



WRITTEN REFERENCES
None

COMMENTS:

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
891-4-2	None	Univ. of Minn.	Liestman/Crew
		PROJECT: 1982 Survey	DATE: 6-21-82

Field Number 48

State Site Number 21AK 47

Location: This site is located 30 meters west of an inlet on the north end of Aitken Lake in Muck's Bay. It is in the SE¼ of the NW¼ of the SE¼ of Section 17, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: This is an historic (c.1920) house foundation on a rise approximately 50 meters from the shoreline. The area around the c.30 square meter dwelling is still partially open. Surrounding vegetation is a mixed hardwood forest. Local informants say that this is the former homestead of an Indian named "Muck," for whom the bay was named. The stone foundation is well-preserved and in no immediate danger of erosion. Since the survey crew was unable to locate the current owner, only surface survey was possible.

Cultural Affliations: Historic (c.1920s)

Collections: U of M survey 1982

U of M Accession Nos.: 892-9-1, 892-8-1

Cultural Material: Two broken pieces of historic ceramic and a fragment of the lower part of a rectangular glass bottle.

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. An attempt to preserve this site should be made, for the archaeological study of even relatively late acculturation situations is becoming increasingly important.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	48	21-AK-47

OWNER
Catholic Church

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
30 meters west of inlet on northernmost end of Aitken Lake (Muck's Bay).

LEGAL DESCRIPTION
SE¼, NW¼, SE¼ Sec 17 T50, R23 (Libby)

SITE TYPE
Foundation, Historic occupation

PROBABLE CULTURAL COMPONENTS:
Historic - 1920's

SITE DESCRIPTION
Foundation is in partially cleared mixed hardwood forest, top of rise, approximately 50 meters in from shore.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Private property, abandoned dwelling.	30 sq. meters

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	50 meters	West

ELEVATION OF SITE: 1241

ELEVATION OF NEAREST WATER: 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey (Unable to contact current owner for permission)

ARTIFACTS OBSERVED, RECOVERED:
2 broken pieces historic ceramics
1 lower part of rectangular glass bottle

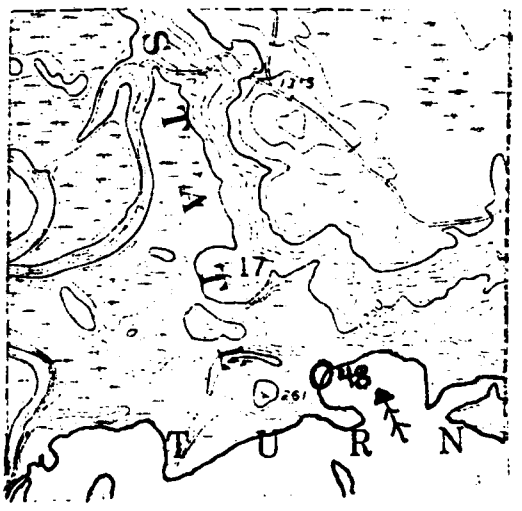
LOCAL COLLECTIONS, INFORMANTS:
Jim Aldrich
Aitken Lake Resort
McGregor, MN 55460

WRITTEN REFERENCES
None

COMMENTS:
Well preserved historic stone foundation and related artifacts. Informed that this is former homestead of an Indian named "Muck" for whom the bay is named.

MAP SCALE:

MAP



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
892-9-1 892-8-1	None	Univ. of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/22/82

Field Number 49

State Site Number 21 AK 48

Location: This site is in an island near the middle of Aitken Lake. It is in the SE¼ of the SE¼ of the NW¼ of Section 20, T 50 N., R 23 W, of the Libby 7.5' Quadrangle.

Description: This lowlying island is frequently flooded. For this reason, it has been shunned as a potential housing development location by its owner. The site area is about 20 square meters along the shoreline of the northeast end of this island. Young ash and basswood form a heavy ground cover at the present time. No features were discovered in subsurface shovel-testing.

Cultural Affliation: Late Woodland (Sandy Lake)

Collections: U of M survey 1982

U of M Accession Nos.: 893-1-2, 893-3-1, 893-4-2, 893-5-1

Cultural Material: Three cord-marked, grit-tempered bodysherds, 2 smoothed-over cord-marked, grit-tempered bodysherds, 2 plain bodysherds, 1 unifacial quartzite scraper, 1 quartzite flake.

Discussion and Recommendations: This site is threatened by the rising water level of the lake. However, since all artifactual materials were found along the shoreline, the site could represent a secondary deposit of material eroded from a now submerged site. This site should be checked whenever possible for additional material that may be washed ashore. Additional shovel-tests should also be made when possible to confirm the shoreline limitation of this site.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	49	21-AK-48

OWNER
Harold Benedict
c/o Johnson Log Const.
County Rd. 21, McGregor, MN 55460

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Island near middle of Aitken Lake, due west of hook shaped point of land on Southeast shore.

LEGAL DESCRIPTION
SE¼, SE¼, NW¼ Sec 20 T50, R23 (Libby)

SITE TYPE
Indeterminate (occupation ?)

PROBABLE CULTURAL COMPONENTS:
Late Woodland (Sandy Lake Ware)

SITE DESCRIPTION
Lowlying island, recently flooded, heavy ground cover, young ash and basswood. Rice stands surrounding it.

SITE CONDITION	CURRENT LAND USE	SITE AREA
Some danger due to rising water level.	Unusable private property	20 sq. meters

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Shoreline	Surrounded

ELEVATION OF SITE:	ELEVATION OF NEAREST WATER:
1220	1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and sub-surface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
3 cordmarked body sherds
2 smoothed over cord marked body sherds
2 plain body sherds
1 unifacial scraper, quartzite
1 lithic waste flake (quartzite)

MAP SCALE:

LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:

MAP

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
893-1-2 893-3-2 893-3-1 893-4-2 893-5-1	None	Univ. of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/22/82

Field Number 50

State Site Number 21 AK 49

Location: This site is on the south shore of Aitken Lake about 500 meters east of the channel which connects it with Big Sandy Lake. It is in the NW¼ of the SE¼ of the SW¼ of Section 20, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: Although no artifacts were found in this area, approximately 12 round depressions measuring from 1 to 1.2 meters in diameter were found within a 30 square meter area. All of these depressions are within 50 meters of the shoreline. The depressions are in a partially cleared mixed deciduous forest that remains undeveloped and is in no immediate danger of erosion. These cultural features are probably historic ricing-jigs.

Cultural Affliation: Probably historic

Collections: None

Cultural Material:

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is recommended. Depressions of this size and form seem to be associated with the historic Ojibwa occupation of northern Minnesota and are common around many of the lakes in the area.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	50	21-AK- 49

OWNER
Harold Benedict
c/o Johnson Log Const.
County Rd. 21, McGregor, MN 55460

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
South shore of Aitken Lake, 500 meters east of channel connecting it to Big Sandy Lake.

LEGAL DESCRIPTION
NW¼, SE¼, SW¼ Sec 20
T50, R23 (Libby)

SITE TYPE
Ricing (?)

PROBABLE CULTURAL COMPONENTS:
Historic (?)

SITE DESCRIPTION
Approximately 12 depressions, roundish, measuring from 1 meter to 1.2 meters in diameter, set in partially cleared mixed deciduous forest. Appear to be cultural.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Undeveloped	30 sq. meters

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	Within 50 m. from shore	East

ELEVATION OF SITE: 1220 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and sub-surface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
None recovered

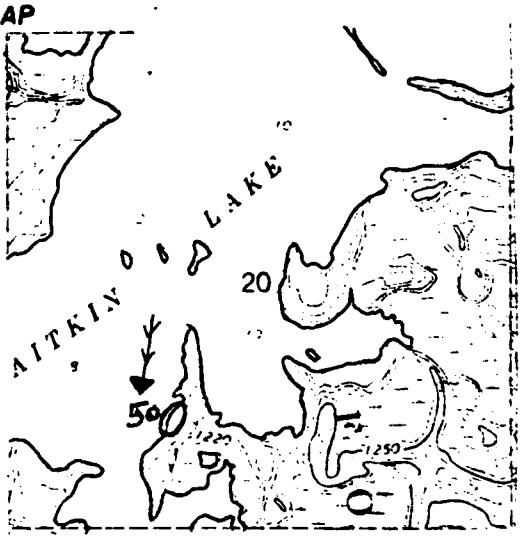
LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
No cultural material associated with these pits. We are assuming they are somehow related to ricing in the near past.

MAP SCALE:

MAP



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
None	None	Univ. of Minn.	Liestman/Crew
		PROJECT: 1982 Survey	DATE: 6/22/82

Field Number 51

State Site Number 21 AK 50

Location: This site is on the north shore of Big Sandy Lake approximately one-half mile southeast of the dam and gaging station. It is in the NE¼ of the SW¼ of the NW¼ of Section 31, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: Artifacts were found eroding out of an embankment and in the roots of a large oak tree along a 30 meter stretch of shoreline. The soil context is a yellowish gravel. Wave action is undercutting the bank and large trees are falling into the lake. The surrounding shoreline is presently undeveloped.

Cultural Affliation: Late Woodland (Blackduck)

Collections: U of M survey 1982

U of M Accession Nos.: 894-5-1, 894-3-1, 894-7-1, 894-3-1

Cultural Material: Twelve cord-marked bodysherds (2 have punctate decoration), 1 possible quartzite core, 8 quartzite waste flakes

Discussion and Recommendations: This site is threatened with rapid destruction. Since the landowner was not located, an effort should be made to receive permission to shovel-test in order to determine the extent of the site. The shoreline should also be examined whenever possible for additional eroding materials that might otherwise be lost in the lake. This is a potentially important Blackduck campsite.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	51	21-AK- 50

OWNER
Unknown

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
North shore of Big Sandy, approximately 1/2 mile Southeast of dam and gaging station. (Near known site 21AK28.)

LEGAL DESCRIPTION
NE¼, SW¼, NW¼ Sec 31 T 50, R23 (Libby)

SITE TYPE
Indeterminate

PROBABLE CULTURAL COMPONENTS:
Late Woodland (Blackduck)

SITE DESCRIPTION
Severely eroded bank of yellowish, gravel like till. Wave action is causing bank to be undercut, large tree (oak, elm, maple) are falling into the lake.

SITE CONDITION	CURRENT LAND USE	SITE AREA
In serious danger of erosion, currently eroding	Undeveloped	30 m. along shore in east/ west direction

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Big Sandy Lake	Shoreline	North

ELEVATION OF SITE: 1230 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey, unable to locate owner

ARTIFACTS OBSERVED, RECOVERED:
12 cordmarked body sherds (2 with punctates)
1 possible core (quartzite)
8 waste flakes (quartzite)

LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
These artifacts were found eroding out of an embankment and in the roots of a large oak tree.

MAP SCALE:

MAP

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
894-5-1 894-7-1 894-3-1		Univ. of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/23/82

Field Number 52

State Site Number 21 AK 51

Location: This site is on the east shore of Sandy River Lake, just south of a marshy point which extends into the lake. It is in the N½ of the SE¼ of the NW¼ of Section 19, T 49 N., R 23 W. of the Minnewawa 7.5' Quadrangle.

Description: Artifacts were found in a possible hearth situated about 50 meters back from the shoreline on a steep bank. Mixed deciduous (maple-basswood) forest covers the upper part of the bank, and tall grass and marsh cover the bank near the waterline. No other artifacts were found in the area outside of the possible hearth. The area is currently undeveloped private property and is in no immediate danger of erosion.

Cultural Affliation: Late Woodland

Collections: U of M survey 1982

U of M Accession Nos.: 895-3-2, 895-4-2, 895-10-2, 895-5-2

Cultural Material: One plain bodysherd, 1 cord-marked bodysherd, 1 quartzite waste flake, 2 pieces of burnt sandstone

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. When possible, the hearth should be excavated, for this area will undoubtedly be developed in the near future.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	52	21-AK- 51

OWNER
Paul Sather - Rte 4
Sather's Store, McGregor, MN 55460

U.S.G.S. QUAD
Minnewawa 7.5' - 1970

SITE LOCATION
East shore of Sandy River Lake, just south of marshy point which extends into lake.

LEGAL DESCRIPTION
N½, SE¼, NW¼ Sec 19
T49, R23 (Minnewawa)

SITE TYPE
Hearth (?)

PROBABLE CULTURAL COMPONENTS:
Late Woodland

SITE DESCRIPTION
Steep bank, mixed deciduous (maple/basswood) on upper part, descending into tall grass and marsh near the waterline.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger from erosion.	Undeveloped private property.	Undetermined

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Sandy River Lake	50 meters	East

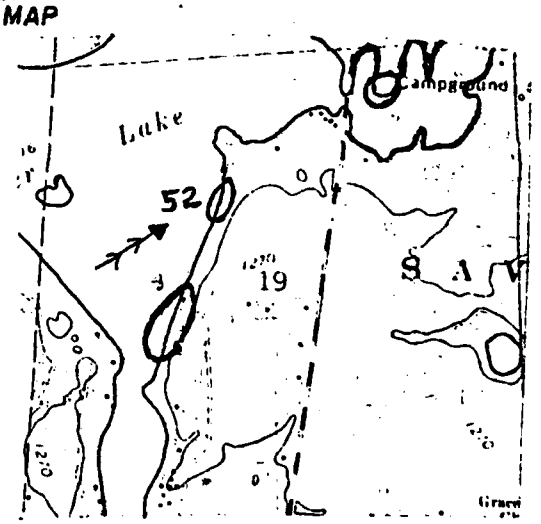
ELEVATION OF SITE: 1230 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
1 plain body sherd
1 cordmarked body sherd
1 waste flake (quartzite)
2 pieces burnt sandstone

MAP SCALE:

MAP



LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
895-3-2 895-10-2 895-4-2 895-5-2	None	University of Minn. PROJECT: 1982 Survey	Liestman/Crew DATE: 6/24/82

Field Number 53

State Site Number 21 AK FS6

Location: This site is situated on an island in Flowage Lake near the eastern shoreline. It is in the SE¼ of the SW¼ of the NW¼ of Section 30, T 49 N., R 23 W. of the Minnewawa 7.5' Quadrangle.

Description: A small number of artifacts were found along the shoreline of a low-lying island now covered with shrubs and marsh grass. The island is actually connected to the shore by a marshy peninsula. Before the rise in waterlevel, this island must have been, therefore, a peninsula point or even near the edge of the river that has been expanded by the dam into a lake. The site is in no immediate danger of erosion.

Cultural Affliation: Late Woodland (Sandy Lake)

Collections: U of M survey 1982

U of M Accession Nos.: 896-3-1, 896-3-2

Cultural Material: Eight smoothed-over, cord-marked, shell-tempered bodysherds

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. It is possible that this is a secondary site, having been redeposited by wave action following the construction of the reservoir dam, since no artifacts were found in primary context back from the shoreline.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	53	21-AK-FS6

OWNER
Unknown

U.S.G.S. QUAD
Minnewawa 7.5' - 1970

SITE LOCATION
Island in Flowage Lake near the eastern shore directly across from large point of land extending in a southwesterly direction

LEGAL DESCRIPTION
SE¼, SW¼, NW¼ Sec 30 T 49 R23 (Minnewawa)

SITE TYPE
Indeterminate (occupation)

PROBABLE CULTURAL COMPONENTS:
Late Woodland (Sandy Lake Ware)

SITE DESCRIPTION
Low-lying island covered with shrubs and marsh grass. It is actually connected to the shore now by a marshlike peninsula.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Unusable.	Less than 30 meters

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Flowage Lake	Shoreline	Surrounded

ELEVATION OF SITE: 1220 **ELEVATION OF NEAREST WATER:** 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and sub-surface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
8 smoothed over cordmarked body sherds

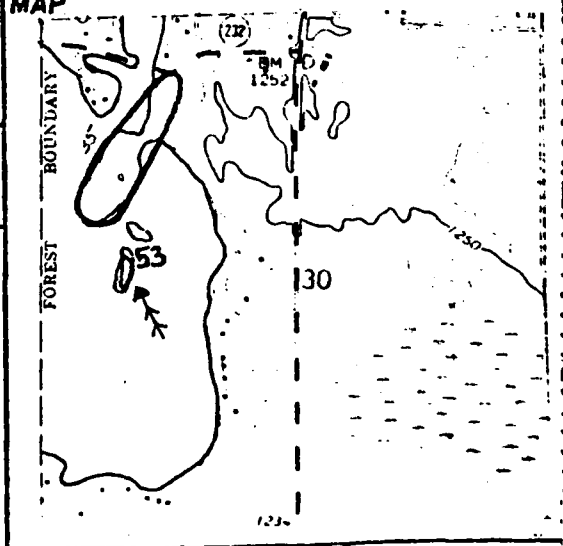
LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:

MAP SCALE:

MAP



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
896-3-1 896-3-2		Univ. of Minn.	Liestman/Crew

Project: 1982 Survey Date: 6/30/82

Field Number 54

State Site Number 21 AK FS7

Location: This site is situated on a large, roughly rectangular island in Aitken Lake, directly north of the channel connecting Aitken amd Big Sandy lakes. It is in the SW¼ of the SW¼ of the SW¼ of Section 20, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: A small number of artifacts were found on the surface of the highest point of a willow and shrub covered island. Rice stands border the site on the south and west sides. All of these artifacts were found within a 10 square meter area about 20 meters from the water's edge. The site area is undeveloped and in no immediate danger of erosion.

Cultural Affliations: Woodland and Historic

Collections: U of M survey 1982

U of M Accession Nos.: 897-8-1, 897-4-1, 897-5-1

Cultural Material: One historic piece of ceramic, 1 plain bodysherd tempered with coarse grit, 2 quartzite waste flakes

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is suggested. This appears to be a small campsite in primary context. It should be investigated whenever possible.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	54	21-AK-FS7

OWNER
Unknown

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Large, roughly rectangular shaped island in Aitken Lake, directly north of channel connecting to Big Sandy Lake.

LEGAL DESCRIPTION
SW¼, SW¼, SW¼ Sec 20 T50, R23 (Libby)

SITE TYPE
Indeterminate

PROBABLE CULTURAL COMPONENTS:
Prehistoric/Historic

SITE DESCRIPTION
Willow and shrub covered island, rising to pointed ridge on north and east sides, gradually turning to rice on south and west. Artifacts on highest point.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Unusable	10 sq. meters

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATER
Aitken Lake	20 meters	Surrounded

ELEVATION OF SITE: 1230

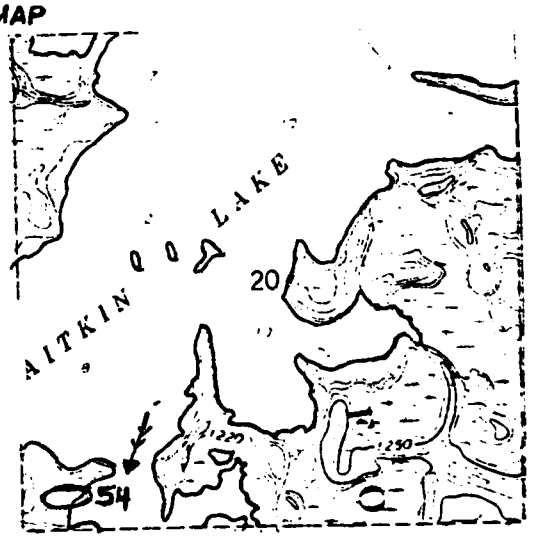
ELEVATION OF NEAREST WATER: 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and subsurface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
1 historic ceramic sherd
1 plain body sherd (thick with coarse grit temper)
2 lithic waste flakes (quartzite)

MAP SCALE:

MAP



LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
These were all on the surface.

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
897-8-1 897-5-1 897-4-1	None	Univ. of Minn Project: 1982 Survey	Liestman/Crow Date: 6/24/82

Field Number 55

State Site Number 21 AK FS8

Location: This site is on a horseshoe-shaped point of land on the eastern shore of Aitken Lake, near the entrance of the channel connecting Aitken and Big Sandy lakes. It is in the N½ of the NW¼ of the SE¼ of Section 20, T 50 N., R 23 W. of the Libby 7.5' Quadrangle.

Description: A small number of artifacts were found along a 10 meter stretch of shoreline in low-lying wet land. The shore is covered with willow shrubs and swamp grasses. The site is in no immediate danger of erosion and is at present undeveloped.

Cultural Affliation: Late Woodland

Collections: U of M survey 1982

U of M Accession Nos.: 898-3-1, 898-5-2, 898-4-2

Cultural Material: One cord-marked bodysherd, 2 plain bodysherds, 2 waste flakes (1 quartzite, 1 grey chert)

Discussion and Recommendations: Since this site is not threatened by erosion at the present time, no immediate action is recommended. It is possible that this is a secondary site, having been redeposited by wave action following the construction of the reservoir dam, since no artifacts were found in primary context back from the shoreline.

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Aitken	None	55	21-AK-FS8

OWNER
Unknown

U.S.G.S. QUAD
Libby 7.5' - 1970

SITE LOCATION
Horeshoe point of land on eastern shore of Aitken Lake, near to where the channel from Big Sandy Lake comes in.

LEGAL DESCRIPTION
N½, NW¼, SE¼ Sec 20 T50, R23 (Libby)

SITE TYPE
Indeterminate

PROBABLE CULTURAL COMPONENTS:
Late Woodland

SITE DESCRIPTION
Willow shrubs and swamp grasses lying along this shore, lowlying wet land. Artifacts found near shore.

SITE CONDITION	CURRENT LAND USE	SITE AREA
No immediate danger of erosion.	Unusable	10 meters in east/west direction along shore

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM WATE
Aitken Lake	Shoreline	North

ELEVATION OF SITE: 1220

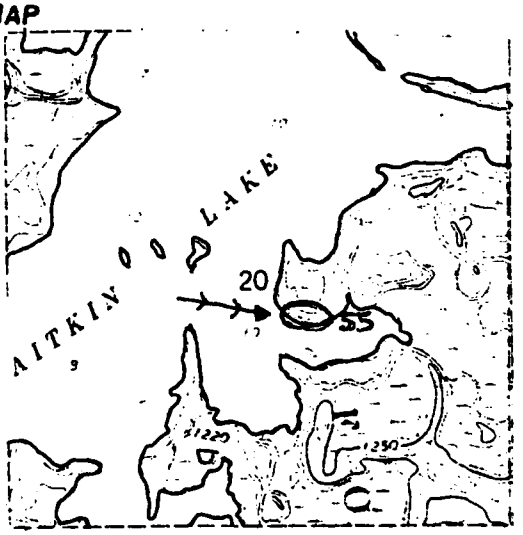
ELEVATION OF NEAREST WATER: 1216

NATURE, EXTENT OF INVESTIGATION: Surface survey and sub-surface shovel testing.

ARTIFACTS OBSERVED, RECOVERED:
1 cordmarked body sherd
2 plain body sherds
2 lithic waste flakes (quartzite & grey chert)

MAP SCALE:

MAP



LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:

ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
898-3-1 898-5-2 898-4-2	None	Univ. of Minn. Project: 1982 Survey	Liestman/Crew Date: 6/27/82

Twenty-two additional sites or "potential" site areas were examined and evaluated. The areas examined and our conclusions are listed below.

During the survey, the crew inevitably stopped and examined some of the many previously recorded sites. Special mention is made here to three of these sites.

1. 21 AK 28 - located in the SE¼ of the NE¼ of the NW¼ of Section 31, T 50 N., R 23 W. The site consists of 32 mounds - supposedly. The survey crew found only 4 mounds. Either the remaining mounds have eroded off the shore or are now so worndown that they are no longer visible on the surface. Erosion in the area is quite heavy. No cultural material was found in the shovel-tests made in the area. If these are eroding mounds, an effort should be made to protect the remaining mounds.

2. 21 AK 29 - located in the NE¼ of the NW¼ of the NW¼ of Section 32, T 50 N., R 23 W. The site is composed of prehistoric, protohistoric, and historic burials. It is on BIA land and is eroding quite heavily at the present time. Plans have apparently been made to riprap the shoreline. This remains an important site on Big Sandy Lake; every effort should be made to protect it from destruction.

3. 21 AK 25 - This site was examined because it was reported to be one of the few remaining extensive sites in the area. However, the survey crew was unable to locate the site in the area indicated by Hudak and Ready's report. Shovel-testing was begun adjacent to the highway and continued with tests every 50' until the shoreline was reached. No cultural material was found.

The remaining areas investigated were unverified "find spots" whose location was included in our scope of work statement.

4. Island in NE¼, SE¼, SE¼, Sec. 25, T 50 N., R 23 W. One sherd was once recovered here. This area is now a bog and inaccessible for survey except during low water-levels. Since many sites were probably inundated following the construction of the dam, it is possible that a site could occur in this area. It should be checked during low water-levels.

5. Island in S½, SW¼, SW¼, Sec. 30, T 50 N., R 23 W. A local collector has located material here. The entire island was surveyed, but no cultural material was found. A deserted cabin was the only sign of habitation.

6. Knoll in S½, SW¼, NW¼, NW¼ and S½, SE¼, NW¼, Sec. 31, T 50 N., R 23 W. This knoll is located within the confines of Hudak's field site number 36. It is of glacial origin and not a cultural feature.

7. Possible burial mound in NW¼, SW¼, NW¼, Sec. 34, T 50 N., R 23 W. Two artifacts were also found at this spot. This area has been heavily disturbed by the widening of County Highway 14. An informant who has lived in the area for 40 years knew of no such mound.

8. Possible small burial mounds at "Frosty" Moore property in Sec. 36, T 50 N., R 23 W. These apparent mounds were leveled last year , when the new owner installed a concrete pad for a mobile home. The survey crew was unable to locate the new owner.

9. Projectile point located on point in N½, SE¼, NE¼, Sec. 1, T 49 N., R 24 W. Approximately 600' of shoreline was surveyed on this point. No cultural material was found. According to local residents, the point floods annually because of its low elevation. The projectile point may have been washed ashore.

10. Island in center of the N½, NE¼, Sec. 6, T 49 N., R 23 W. Flake scatter has been reported for the island. This is an island that was surveyed by Hudak and Ready, and by the 1981 University of Minnesota fieldschool. No artifacts were found in either survey. A glance at the map at the end of this report will indicate that this island was once a raised interior section of a much larger island before the construction of the dam. It is possible that artifactual material from now inundated sites occasionally wash onto the present shore.

11. Projectile point and skeleton reported in SE¼, Sec. 7, T 49 N., R 23 W., at Johnson cabin on point. This area was extensively surveyed by the 1981 University of Minnesota fieldschool. This area was undoubtedly a site at one time, for local collectors report finding large amounts of pottery along the shoreline; in fact, it is known as one of the best artifact collecting beaches in the area. However, the ground has been heavily disturbed by the construction of a house and the earthen platform on which it was built. Earth was apparently taken from around the house to build the platform. Although no artifacts were found during our shovel-testing survey, part of the site may still exist under the platform (where the skeleton apparently came from); other parts of the site were probably destroyed by the rise in lake-level following the construction of the dam. This latter event would explain the large numbers of artifacts found along the present shoreline in the past.

12. Biface fragment near center of the E½, Sec. 9, T 49 N., R 23 W., approximately 100 meters south of the Schmitt cabin. The shoreline

was walked and shovel-testing performed around the cabin, but no additional cultural material was found.

13. Possible mound at last cabin on bluff top at the south side of the Prairie River outlet. This possible mound does exist. It is southeast of the cabin and about 9' in diameter. Without partial excavation, it is impossible to determine whether this is a cultural feature. No artifacts were found in the area.

14. Possible mounds at Miner's Point in SW¼, SW¼, Sec. 9, T 49 N., R 23 W. These directions proved confusing. Miner's Point is south of Davis Bay, while the SW¼ of Sec. 9 is at is known as Tower Pines Point. This latter area is now very heavily developed and no mounds remain - if they did exist here at one time. The present owner, Jerry Sheehan, was not available during the survey.

15. Possible mounds on the Lake Minnewawa Road past the Shamrock Ballroom, south of Davis Bay. Possible Chippewa cemetery in this area also. These directions are also confusing. The Lake Minnewawa Road does not go near the Shamrock Ballroom - which is not south of Davis Bay. More precise directions are needed if possible.

16. Possible site on former gravel road, now a garbage dump across from the fire tower on Highway 14. This possible site area was bladed-over about 5 years ago after the dump was closed. No artifacts were found during a shovel-test survey. The area is highly disturbed.

17. Grooved maul was reportedly found at Perry property on long, narrow, westward projecting peninsula in SW¼, NW¼, NE¼, Sec. 18, T 49 N., R 23 W. Shovel-testing did not result in any additional artifacts being found. The maul seems to have been an isolated find. The Perry's no longer own the property.

18. Possible mound in NE¼. NE¼, Sec. 19, Y 49 N., R 23 W., on westward projecting point. A roughly circular large mound is present in this area approximately 75 yards from shore. It is immpossible to determine whether the mound is cultural without testing. This possible mound should be protected until its origin can be determined.

19. Numerous artifacts have been found on the shore of the cove along the north section line of Sec. 20, T 49 N., R 23 W., particularly at Kare Phree Pines Resort, and around the Stringham and Halverson cabins. This area was checked throughly and no cultural material was found. Mrs. Stringham gave permission for shovel-testing on her property, but again these tests proved sterile. According to local lore, this area is one end of a portage to the lake to the south.

8. CONCLUSIONS

The 1982 cultural resources reconnaissance survey of the Big Sandy Reservoir not investigated by the Hudak-Ready survey supports and adds to the conclusions drawn in that earlier survey (Hudak and Ready 1978). The most important of these conclusions are listed below:

1. A very large number of sites representing a long time span occur or at least once occurred within the reservoir area. As our brief discussion of trends in the culture history of the Headwaters region indicated (section B in CHapter 4), the largest numbers of prehistoric sites date to the Late Prehistoric period. The numbers of components for the prehistoric period are: Terminal Glacial - Early Prehistoric = 6 (all found during the Hudak-Ready survey); Middle Prehistoric = 5 (4 from the Hudak-Ready survey and 1 from the 1982 survey); Late Prehistoric = 27 (19 from the Hudak-Ready survey and 8 from the 1982 survey). The numbers of sites associated with historic periods are: Initial Historic = 1 (from the Hudak-Ready survey); Fur Trade = 3 (from the Hudak-Ready survey); Intensive Resource Use period = 3 (2 from the Hudak-Ready survey and 1 from the 1982 survey); Recent period = 1 (from the 1982 survey). Sixteen additional sites were assigned to the Middle-Late Prehistoric period on the basis of the presence of ceramics and/or earthen burial mounds (14 from the Hudak-Ready survey and 2 from the 1982 survey), and an additional 3 sites are associated with one of the historic periods but a more precise assignment could not be made (all from the 1982 survey).

Although no Terminal Glacial - Early Prehistoric period sites were found during the 1982 survey, the area was occupied during this period. For example, Hudak and Ready (1978) report six xomponents from this period and Old Copper artifacts have been reported by a number of property owners. These latter artifacts have almost always been found in deeply buried deposits, which suggests that early sites in the reservoir area may be deeply buried and, therefore, less likely to be found through surface survey and shovel-testing. Archaic projectile points occur in a number of local collections, and parallel-flaked Paleo-Indian projectile points have been reported from near the eastern end of the Savanna Portage (Woolworth 1969:2). As far as we could determine, all of these points were found along the shoreline or on the surface near other bodies of water than those surveyed.

Although it is difficult to estimate the numbers of early period sites, a significant rise in numbers of sites almost certainly occurred during the Middle Prehistoric and, especiall-, during the Late Prehistoric period.Analysis of the Indian Mound Point site (21 AK 7) by the Principal Investigator shows a largely Middle Prehistoric period occupation dominated by Brainerd Ware and St. Croix Stamped pottery. In cintrast, the Battle Island site (21 AK 9) has a Late Prehistoric period occupation dominated by Sandy Lake Ware; a small

amount of Blackduck pottery was also found at this site as well as 1 decorated Oneota bodysherd. If these two sites are typical of their time periods, then features such as refuse pits are rare in the area; bone preservation is either very poor or faunal remains occur in very small numbers.

It is difficult to evaluate the merits of the focal-diffuse model on the basis of the small numbers of artifacts collected during the Hudak-Ready and the 1982 surveys. However, a future study of the stone debitage recovered from the sites discovered in the reservoir area might provide some clues to changing degrees of tool-kit variability over time. All of the ricing-jigs discovered in the area seem associated with Sandy Lake Ware or historic Ojibwa occupations. It is probably fair to conclude that the interpretation of the archaeological remains in the area is in an initial phase of development.

2. The construction of the Big Sandy Reservoir dam has significantly damaged the archaeological resources of the reservoir system. Many sites found during both the Hudak-Ready survey and the 1982 survey probably represent redeposited materials washed ashore from now submerged sites. Map 2 attached to the inside backcover shows the outline of the pre-dam shoreline. This flooding and erosional event would explain the large numbers of artifacts once discovered by local collectors along the shoreline. A significant number of sites in the reservoir area are, therefore, secondary deposits without significant context. These sites should be visited periodically and freshly deposited artifacts collected. The 1982 survey was able to examine all *remaining unsurveyed* areas of Big Sandy Lake as well as the shorelines of Aitkin and Flowage lakes, and part of the shoreline of Big Sandy River Lake. The shorelines of these latter lakes are now covered with extensive beds of marsh. In fact, the southern lakes in the reservoir were largely created by the widening of the river that flowed through the area following the construction of the reservoir dam. Many archaeological sites were probably destroyed in these areas, too.

3. Every effort should be made to protect or investigate the few remaining sites along the shoreline of the reservoir system that retain their primary context. Those sites whose significance could not be determined during the 1982 survey should be evaluated as soon as possible.

A number of the major recommendations made in this report that *oncern site preservation are reviewed below:*

a. Although most cultural resources surveys are conducted during the summer months when trained personnel are most readily available, the most efficient time to conduct a reconnaissance survey of reservoir areas where the water-level has been significantly raised (such as the Big Sandy Reservoir system) is during spring and fall months when the water-level is at its lowest and survey remains possible (e.g., ice does not

cover the shoreline). While these are the months of maximal site exposure, on the negative side these are also periods when land-owners are difficult to locate in summer resort areas.

b. Of the 15 new sites or find-spots located during the 1982 cultural resources reconnaissance survey, no immediate is recommended for 14 of them (field numbers 41 - 50 and 52 - 55); one of these sites or find-spots (field number 51) is threatened with destruction and shovel-testing should be performed when possible to determine whether a Phase two survey is necessary. Although no immediate action is recommended for 14 of the 15 sites located, a number of them should be shovel-tested or checked again for newly redeposited materials when possible (these are field numbers 41 - 43 and 45 - 49).

c. An effort should be made to determine whether 21 AK 28 does consist of burial mounds that should be protected from further erosion. Of a reported 32 mounds, only 4 were located by the survey crew; either the remaining mounds have eroded off the present shore or are now so worndown that they are no longer visible from the surface. It is impossible to determine whether these mounds are cultural features without excavation or other means of subsurface probing. We should assume that they are cultural features until a more precise determination c an be made.

d. Two historic sites (field numbers 4 and 29) reported by the Hudak-Ready survey should be considered for potential nomination to the National Register of Historic Places. The first is a Northwest Company fur post that is threatened by erosion along its eastern edge (other structures associated with this site have already been inundated by reservoir waters). The second is 21 AK 29, an historic, protohistoric, and possibly prehistoric burial ground on BIA land. Sufficient information now exists on these two sites, that Phase two surveys are probably not necessary to make a determination regarding their candidacy for nomination to the National Register.

e. Although specific details are not given here, it is recommended that a number of the "unverified find spots" be reinvestigated when possible (unverified find spot numbers 4, 13, 15, and 18 as listed in Chapter 7). More detailed evaluations and recommendations for each site, find-spot, or unverified find-spot are contained in Chapter 7.

No specific cost and time estimates are given here to carry out the recommendations made above. Since immediate reinvestigation is suggested for only 2 sites (21 AK 28 and field number 51), this work could be incorporated within other projects within the reservoir system; the cultural resources staff at the Corps of Engineers could evaluate the potential for nomination to the National Register of Historic Places of the fur post and 21 Ak 29.

Little attention has been given in this report to historic and

architectural cultural resources, for few were encountered. However, as the Woolworth (1969) report indicates, the historic period in the Big Sandy Reservoir area was dynamic and in many ways piyotal in the development of post-contact Minnesota as we now know it. The Savannah Portage just to the east of the reservoir area was for many years a major artery of traffic into central Minnesota. Legacies of this Fur Trade period activity are the Northwest post on Brown's Point (field number 4), the historic and protohistoric cemetery on the north edge of Big Sandy Lake (field number 29), and the American Fur Company post (called the Aitkin Post) at the confluence of the Mississippi and Sandy rivers. It has been recommended that the first two of these sites be considered for potential nomination to the National Register of Historic Places; although outside of our survey area, the American Fur Company post also deserves similar consideration. Investigations by the senior author over the past three years of the Savanna Portage, the Northwest post, and the American Fur Company post should bring the importance of these Fur Trade period sites into greater prominence.

Finally, the St. Paul District of the U.S. Army Corps of Engineers is to be commended for their efforts in the preservation of the prehistoric and early historic cultural resources of the Big Sandy Reservoir system.

REFERENCES CITED

Anderson, D. 1979. Laurel Ware. In A Handbook of Minnesota Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 121-135. Minnesota Archaeological Society, Fort Snelling.

Anfinson, Scott, ed. 1979. A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5. Minnesota Archaeological Society, Fort Snelling.

Birk, D. 1977. Two Sandy Lake Ware Vessels from Onigum Point, Cass County, Minnesota. Minnesota Archaeologist 36(1):9-15.

_____. 1979a. Brainerd Ware. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 45-50. Minnesota Archaeological Society, Fort Snelling.

_____. 1979b. Sandy Lake Ware. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 175-182. Minnesota Archaeological Society, Fort Snelling.

Birks, H.J.B. 1976. Late-Wisconsinian Vegetational History at Wolf Creek, Central Minnesota. Ecological Monographs 46:395-429.

_____. 1981. Late Wisconsin Vegetational and Climatic History at Kylen Lake, Northeastern Minnesota. Quaternary Research 16: 322-355.

Bleed, P. 1969. The Archaeology of Petaga Point: The Preceramic Component. Minnesota Prehistoric Archaeology Series, No. 2. Minnesota Historical Society, St. Paul.

Brower, J.V. 1898. Prehistoric Man at the Head of the Mississippi, in Collections of the Minnesota Historical Society 8:238-239. Minnesota Historical Society, St. Paul.

_____. 1901. Kathio, in Memoirs of Explorations in the Basin of the Mississippi 4:57-58. St. Paul.

Caine, C. 1979. Malmo/Kern Series. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology No. 5, pp. 137-141. Minnesota Archaeological Society, Fort Snelling.

Center for Environmental Studies. 1973. Environmental Review of the Headwaters of the Mississippi Reservoir Projects. Bemidji State College (Univ.).

Cleland, C. 1977. The Focal-Diffuse Model: An Evolutionary Perspective on the Prehistoric Cultural Adaptations of the Eastern United States. Mid-Continental Journal of Archaeology 1(1):59-76.

Cooper, L., and E. Johnson. 1964. Sandy Lake Ware and Its Distribution. American Antiquity 29:474-479. Salt Lake City.

Daniel, G., and J. Sullivan. 1981. The North Woods of Michigan, Wisconsin, and Minnesota. Sierra Club Books, Sand Francisco.

George, D. 1979. St. Croix Stamped Series. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 169-174. Minnesota Archaeological Society, Fort Snelling.

Hart, E. 1964. Map of Big Sandy Lake. Pamphlet Collection, Reference Library, Minnesota Historical Society, St. Paul.

Hudak, G.J., and T. Ready. 1978. Cultural Resources Inventory of Lands Adjacent to Big Sandy Lake. Science Museum of Minnesota, St. Paul.

Johnson, E. 1964. Twenty New Radiocarbon Dates from Minnesota Archaeological Sites. Minnesota Archaeologist 26:34-49. Minneapolis.

_____. (and others) 1977. Cultural Resources Inventory of Lands Adjacent to Lake Winnibigoshish. U.S. Army Corps of Engineers, St. Paul District.

Lothson, G. 1972. Burial Mounds of the Mille Lacs Lake Area. M.A. thesis, University of Minnesota, Archaeology Laboratory, Minneapolis.

Lugenbeal, E. 1976. The Archaeology of the Smith Site: A Study of the Ceramics and Culture History of Minnesota Laurel and Blackduck. Ph.D. Dissertation, University of Wisconsin-Madison.

_____. 1979. Blackduck Ware. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 23-37. Minnesota Archaeological Society, Fort Snelling.

Ojakangas, R., and C. Matsch. 1982. Minnesota's Geology. University of Minnesota Press, Minneapolis.

Ready, T. 1979a. Onamia Series. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 149-155. Minnesota Archaeological Society, Fort Snelling.

_____. 1979b. Kathio Series. In A Handbook of Minnesota Prehistoric Ceramics. Occasional Publications in Minnesota Anthropology, No. 5, pp. 103-107. Minnesota Archaeological Society, Fort Snelling.

Shay, C.T. 1971. The Itasca Bison Kill Site: An Ecological Analysis. Minnesota Prehistoric Archaeology Series, No. 6. Minnesota Historical Society, St. Paul.

Steinbring, J. 1974. The Preceramic Archeology of Northern Minnesota. In Aspects of Upper Great Lakes Anthropology, ed. E. Johnson, Minnesota Prehistoric Archaeology Series, No. 11.

_____, and J. Whelan. 1971. Test Excavations at the Fish Lake Dam Site. Minnesota Archaeologist 31:3-40.

Stoltman, J. 1971. Prismatic Blades from Northern Minnesota. Plains Anthropologist 16(52):105-110. Lincoln.

_____. 1973. The Laurel Culture in Minnesota. Minnesota Prehistoric Archaeology Series, No. 8. Minnesota Historical Society, St. Paul.

Watrall, C. 1969. Unpublished report, Minnesota Historical Society, St. Paul.

Wilford, L. 1941. A Tentative Classification of the Prehistoric Cultures of Minnesota. American Antiquity 6:231-249.

_____. 1953. Unpublished manuscript on Kern site excavations. Wilford Laboratory of Archaeology, University of Minnesota, Minneapolis.

_____. 1955. A Revised Classification of the Prehistoric Cultures of Minnesota. American Antiquity 21:130-142.

Woolworth, N. 1969. Savanna Portage Southwest. Unpublished manuscript, Wilford Laboratory of Archaeology, University of Minnesota, Minneapolis.

Wright, H.E. Jr. 1972. Physiography of Minnesota, pp. 561-578. Quaternary History of Minnesota. In P.K. Sims and G.B. Morey, eds. Geology of Minnesota, a Centennial Volume. Minnesota Geological Survey, St. Paul.

_____, and W.A. Watts. 1969. Glacial and Vegetational History of Northeastern Minnesota. Minnesota Geological Survey, Special Publication 11.

APPENDIX A

SCOPE OF WORK
CULTURAL RESOURCES INVESTIGATION
OF BIG SANDY RESERVOIR
AITKIN COUNTY, MINNESOTA

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources reconnaissance survey of the shoreline of Big Sandy Reservoir, Aitkin County, Minnesota.

1.02 This cultural resources inventory is being done in partial fulfillment of the obligations of the St. Paul District regarding cultural resources, as set forth in the Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), the National Environmental Policy Act of 1969 (P.L. 91-190), Executive Order (E.O.) 11593 for the Protection and Enhancement of the Cultural Environment (Federal Register, 13 May 1971), the Archaeological Conservation Act of 1974 (P.L. 93-291), the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR Part 800), the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60), and Corps of Engineers regulations (ER 1105-2-460) "Identification and Administration of Cultural Resources" (Federal Register, 3 April 1978).

1.03 The above laws establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in P.L. 93-291 and E.O. 11593, are being taken by the Corps "...to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 The Executive Order further directs Federal agencies "...to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans, and programs in such a way that federally and non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several purposes.

The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only partially fulfills federally mandated legal requirements but also serves as a scitnific reference for future professional studies. It will identify sites which may require additional investigations and which may have potential for public-use development. Therefore, the report must be analytical, not just descriptive.

2.00 PROJECT DESCRIPTION

2.01 Big Sandy Reservoir is located about 120 miles north of the Twin Cities in Aitkin County. Sandy Lake Dam is on the Sandy River 1-1/4 miles above the junction of the Sandy and Mississippi Rivers and 264 river miles above St. Paul. The dam controls runoff from a 421-square mile drainage area. The eight natural lakes encompassed in this drainage area include Sandy, Aitkin, Sandy River, Rat, Flowage, Round, Davis, and Tiesen Lakes.

2.02 With a total storage capacity of 72,500 acre-feet, the lake covers an area of 16.6 square miles at maximum elevation of 1218.31 feet above mean sea level. Although the normal operating elevation of the lake is 1216.31, during periods of abnormally high inflow storage is utilized up to the 1218.31-foot elevation. Stored floodwater is released during the summer to augment flows in the Mississippi River for water supply, hydroelectric power, and other beneficial uses. Low-flow releases are restricted to inflow or to State of Minnesota recommended minimums. The dam is controlled by a log sluice, five gated sluices, and one stop-log sluice. A lock, no longer ised for navigation, now serves as an additional outlet controlled by stop logs.

2.03 Dam construction and subsequent rise of the water level (and associated water tables) by approximately 9 feet has resulted in a reservoir area of 16.6 square miles, as compared to the original lake area of only 8 square miles. This increase is a product of the considerable enlargement of Aitkin Lake, Prairie and Sandy River flowages, and also inundation of upland beyond the original Big Sandy shoreline.

2.04 The Federal Government holds fee title to over 1,116 acres of land and flowage easements on another 9,785 acres at Big Sandy Lake. Those lands presently administered by the Corps of Engineers are located on a narrow strip around the northern perimeter of Big Sandy Lake and on one large tract at the dam structure. In addition, the Bureau of Indian Affairs administers two parcels of land.

2.05 The forest vegetation surrounding Big Sandy Lake is principally deciduous. Elm-ash with some aspen and oak is found at lower elevations associated with marsh habitats. Maple-basswood intermixed with aspen and oak is predomiant. There are almosr no pure pine stands, although there are some pine-mixed hardwood communities on the east and

southeast shore of Big Sandy.

2.06 Aitkin County, in which Sandy Lake is located, is predominantly till plain with a large outwash area immediately to the northeast characterized by surface deposits of sand and gravel. The soil of the till plain area is brownish and slightly acidic, with pebbles and boulders of granite and gneiss. The shoreline is highly irregular with moderate on and off-shore grades such that a 1-foot vertical change in the water level can alter the shoreline 5 to 20 feet horizontally. There are some exceptionally flat areas, but the lake edge is almost totally uniform in the 5 to 19 percent slope range.

2.07 A cultural resource survey of the shoreline of Big Sandy Reservoir, including all Corps-owned land, was conducted in 1978. This survey located 35 archaeological sites, the majority of these on Sandy Lake itself. The results of this survey are detailed in the report entitled Cultural Resources Inventory of Lands Adjacent to Big Sandy Lake by G. Joseph Hudak and Timothy L. Ready of the Science Museum of Minnesota under contract with the St. Paul District.

3.00 DEFINITIONS

3.01 For the purposes of this study, the cultural resources investigation will include a Phase I cultural resources survey. A literature and records search and review, and Phase II testing will not be conducted at this time.

3.02 "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archaeology, or culture of an area.

3.03 "Literature and records search" is defined as a search for and examination of written reports, books, articles, files, records, etc., published and unpublished (found in private, local, State, and Federal depositories), which are pertinent to the cultural resources investigation to be carried out for a particular project. The purposes of the literature and records search are: to familiarize the Contractor with the culture history of the study area and past investigations which have been carried out in the area; to document the location and condition of known sites which may exist within the project area, the extent of past work undertaken at the site, and any other information which may be relevant in assessing the significance of the site; and to provide this information in a summarized form to the agency requesting the search. Although existing data may be extensive, the literature and records search should be as comprehensive as possible in providing a usable body of data for the purposes outlined above.

3.04 "Literature and records review" is defined as the review and evaluation of the pertinent literature and records examined under section 3.03. The purpose of the literature and records review is to pro-

vide the sponsoring agency with the Contractor's professional opinion as to the quality, nature, and extent of the sources identified in the literature and records search (see section 5.11).

3.05 "Phase I cultural resources survey" is defined as an intensive, on-the-ground survey and testing of an area in order to determine the number and extent of the archaeological, historic, and architectural resources present and their relationship to all the project alternatives and features. A Phase I cultural resources survey will result in data adequate to assess the general nature of all sites present; a recommendation for additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information; and detailed time and cost estimates for Phase II testing.

3.06 "Phase II testing" is defined as the intensive testing of those sites which may provide important cultural and scientific information. Phase II testing will result in data adequate to determine the eligibility of the resources for inclusion on the National Register of Historic Places, a plan for the satisfactory mitigation of eligible sites which will be directly or indirectly impacted, and detailed time and cost estimates for mitigation. Phase II testing will not be conducted under this contract.

4.00 SURVEY SPECIFICATIONS

4.01 The Phase I cultural resource survey will include those lands along the shoreline of Big Sandy, including all islands, not previously surveyed as shown on the inclosed map. (See Map 2 attached to the backcover)

4.02 If time and funds allow, a Phase I cultural resource survey will include the shoreline of Aitkin Lake, approximately 13 miles.

4.03 The area to be surveyed will include all lands within 50 meters of the water's edge.

4.04 In those areas of shoreline with evidence of erosion, the survey will include all lands from the water's edge to 50 meters inland from the edge of the eroded bank.

4.05 All islands not previously investigated will be surveyed in their entirety.

4.06 The following two known sites will be field checked to determine site type and condition:

a. 21 AK 28 - located in the SE¼, NE¼, NW¼, Sec. 31, T. 50 N., R. 23 W. Site consists of 32 low mounds.

b. 21 AK 29 - located in the NE¼, NW¼, NW¼, Sec. 32, T. 50 N., R. 23 W. Site consists of prehistoric, protohistoric and historic burials.

4.07 An attempt will be made to locate in the field the following unverified find spots:

a. Island in NE¼, SE¼, SE¼, Sec. 25, T. 50 N., R. 24 W. One sherd recovered.

b. Island in S½, SW¼, SW¼, Sec. 30, T. 50 N., R. 23 W. A local collector has located material here.

c. Knoll in S½, SW¼, NW¼, NW¼m and S½, SE¼, NW¼, NW¼, Sec. 31, T. 50 N., R. 23 W.

d. Possible burial mound in NW¼, SW¼, NW¼, Sec. 34, T. 50 N., R. 23 W. Two artifacts recovered here also.

e. Possible small burial mounds at "Frosty" Moore property in Sec. 36, T. 50 N., R. 23 W.

f. Projectile point located on point in N½, SE¼, NE¼, Sec. 1, T. 49 N., R. 24 W.

g. Island in center of the N½, NE¼, Sec. 6, T. 49 N., R. 23 W. Flake scatter.

h. Projectile point and skeleton reported in SE¼, Sec. 7, T. 49 N., R. 23 W., at Johnson cabin on point.

i. Biface fragment near center of the E½, Sec. 9, T. 49 N., R. 23 W., approximately 100 meters south of Schmitt cabin.

j. Possible mound at last cabin on bluff top at the south side of Prairie River outlet.

k. Possible mounds on Miner;s Point in SE¼, SW¼, Sec. 9, T. 49 N., R. 23 W.

l. Possible mounds on the Lake Minnewawa Road past the Shamrock Ballroom, south of Davis Bay. Possible historic Chippewa cemetery in this area also.

m. Possible site on former gravel road, now garbage dump across from the fire tower on Highway 14.

n. Grooved maul was reportedly found at Perry property on long, narrow westward projecting peninsula in SW¼, NW¼, NE¼, Sec. 18,

T. 49 N., R. 23 W.

o. Possible mound in NE¼, NE¼, Sec. 19, T. 49 N., R. 23 W., on westward projecting point.

p. Numerous artifacts have been found on the shore of the cove along north section line of Sec. 20, T. 49 N., R. 23 W., particularly at Kare Phree Pines Resort, Stringham and Halverson cabins.

q. The following known site, 21 AK 25, will be field checked to determine site type and condition.

5.00 PERFORMANCE SPECIFICATIONS

5.01 The Contractor will utilize a systematic, interdisciplinary approach in conducting the study. The Contractor will provide specialized knowledge and skills during the course of the study to include expertise in archeology, history, architectural history and other social and natural sciences as required.

5.02 The extent and character of the work to be accomplished by the Contractor will be subject to the general supervision, direction, control, review and approval of the Contracting Officer.

5.03 Techniques and methodologies that the Contractor uses during the investigation shall be representative of the current state of knowledge for their respective disciplines.

5.04 The Contractor shall keep standard records which shall include, but not be limited to, field notebooks, site survey forms, field maps, and photographs.

5.05 The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for research and public view. If such materials are not in Federal ownership, the consent of the owner must be obtained, in accordance with applicable law, concerning the disposition of the materials after completion of the report. The Contractor will be responsible for making curatorial arrangements for any collections which are obtained. Such arrangements must be coordinated with the appropriate officials of Minnesota and approved by the Contracting Officer.

5.06 When sites are not wholly contained within the study area, the Contractor shall survey an area outside the study area limits large enough to include the entire site boundaries and to determine the degree to which the site will be impacted.

5.07 The Contractor shall provide all materials and equipment as may be necessary to expeditiously perform those services required of the study.

5.08 Should it become necessary in the performance of the work and services, the Contractor shall, at no cost to the Government, secure the rights of ingress and egress on properties not owned or controlled by the Government. The Contractor shall secure the consent of the owner, his representative, or agent, in writing prior to effecting entry on such property. If requested, a letter of introduction, signed by the District Engineer, can be provided to explain the project purposes and request the cooperation of landowners. Where a landowner denies permission for survey, the Contractor shall immediately notify the Contracting Officer and shall describe the extent of the property to be excluded from the survey.

Phase I Survey

5.09 The on-the-ground examination will involve an intensive survey and subsurface informal testing of the area in order to determine the total number and extent of cultural resources present. This includes standing architectural structures as well as historic and prehistoric archeological sites.

5.10 The survey shall include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing where surface visibility is limited. Subsurface investigation will include shovel testing, coring, soil borings, or cut bank profiling, where necessary and appropriate.

5.11 The recommended grid or transect interval is 15 meters (50 feet). However, this interval may vary depending upon field conditions. If the recommended interval is not used, justification should be presented for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh.

5.12 The tested areas will be returned as closely as practical to pre-survey conditions by the Contractor.

6.00 GENERAL REPORT REQUIREMENTS

6.01 The Contractor will submit the following types of reports, which are described in this section and in section 9.00: field report, field notes, draft contract report, and a final contract report.

6.02 The Contractor's technical report shall include, but shall not be limited to, the following sections as appropriate to the study.

a. Title Page: The title page shall provide the following information: the type of investigation undertaken; the cultural resources which were assessed (archeological, historical, and architectural); the project name and location (county and State); the name of the author(s) and/or Principal Investigator; the signature of the Principal Investiga-

tor; and the agency for which the report is being prepared.

b. Abstract: An abstract of findings, conclusions, and recommendations. This should not be an annotation.

c. Management Summary: This section will include a concise summary of the study, which will contain all essential data for using the document in the Corps of Engineers management of the project. This information will minimally include: why the work was undertaken and who the sponsor is, a brief summary of the scope of work and budget, summary of the study (field work; lab analysis; literature and records search and review, including the National Register of Historic Places, dates checked, and results), study limitations, study results, significance, recommendations and the repository of all pertinent records and artifacts.

d. Table of Contents

e. List of Figures

f. List of Plates

g. Introduction: This section shall identify the sponsor (Corps of Engineers) and the sponsor's reason for the study; provide an overview of the archeological/historical study to be undertaken; define the location and boundaries of the study area (with regional and area-specific maps); define the study area within its cultural, regional, and environmental context; reference the scope of work; identify the institute that did the work, the number of people involved in the study, the number of person-days/hours utilized during the study; identify the dates when the various types of work were completed; identify the repository of records and artifacts; and provide a brief overview or outline of how the study report will proceed and an overview of the major goals that the study/study report will accomplish.

h. Environmental Background: This section shall include a description of the study area and regional environment, including the following categories: geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the the relationship of the environmental setting to the area's prehistory and history shall be included. This section shall be of a length commensurate with other report sections.

i. Theoretical and Methodological Overview: This section shall include a description or statement of the goals of the Corps of Engineers and the study researcher, the theoretical and methodological orientation of the study, and the research strategies that were applied in achieving the stated goals.

j. Field Methods: This section will describe specific archeological and historical activities that were undertaken to achieve the stated theoretical and methodological goals. The section shall include all field methods, techniques, strategies, and rationale or justification for specific methods or decisions. The description of the field methods shall minimally include: a description of the areas surveyed, survey conditions, topographic/physiographic features, vegetation conditions, soil types, stratigraphy, survey limitations, survey testing results with all appropriate testing forms to be included as an appendix (e.g., shovel tests, coring, cut bank profiles, etc.), degree of surface visibility, whether or not the survey resulted in the location of any cultural resources, the methods used to survey the area (pedestrian reconnaissance, subsurface test, etc.), the rationale for eliminating uninvestigated areas, the estimated size of the investigated sample and its relationship to the sample universe (e.g., 100 acres were surveyed, representing 15 percent of the project impact area), and the grid or transect interval used. Testing methods shall include descriptions of text units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

k. Analysis: This section will describe and provide the rationale for the specific analytic methods and techniques used, and describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed. This section shall also contain references to accession numbers used for all collections, photographs, and field notes obtained during the study, and the location where they are permanently housed.

l. Investigation Results: This section will describe all the archeological and historic resources encountered during the study, and any other data pertinent to a complete understanding of the resources within the study area. This section shall include enough empirical data that the study results can be independently assessed. The description of the data shall minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation and soil types, project alternatives, and direct and indirect impact areas; analysis of the site and data (e.g., site type, cultural historical components and information, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent). The information shall be presented in a manner that can be used easily and efficiently by the Corps of Engineers. This site information shall be presented with each site discussed on a separate page/pages and the site location indicated on a USGS map. If a site location has not been field-verified, the Contractor must indicate the approximate area on the map and indicate that it has not been verified, or give an explanation why the site cannot be

located on a map. An example of this site description format follows:

Site Number and Name

Complete Legal Description: Township, Range, Section, County or Address, if appropriate. Indicate if the site has been field-verified or not, when and by whom.

Complete USGS Quadrangle Reference: Quad name, Quad size, all Quad dates.

Report Figure/Map/Plate Reference

Accession Numbers

Site Type, Site Reports, Investigations of Dates

Cultural Affliation (with dates or date estimates)

Environmental Descriptions: Briefly, to include topography, physiography, soils, and vegetation.

Site Description

Present Site Condition: Disturbed, undisturbed, vegetation, soils, and surface material.

Site Significance: As reported by others and the Contractor's evaluation, including an evaluation of previous conclusions.

Impacts: Evaluate the direct and indirect impacts affecting the site.

Recommendations: Management recommendations, future archeological/historic work recommendations.

Remarks: For comments with no other category.

Pertinent Bibliographic References

The location of all sites and other features discussed in the text will be shown on a legibly photocopied USGS map and will be bound into the report. Maps shall also be included showing the relationship of sites to the project areas which were surveyed. In addition, the project map will show those areas that have been eliminated from the survey due to unacceptable survey conditions. Maps should also show the type of survey method employed for each area surveyed (for example, pedestrian walkover, shovel tests). All maps will be labeled with a caption/description, a north arrow, a scale bar, township, range, map size, and dates, and

the map source (e.g., the USGS quad name or published source) and will have proper margins. All sites will be recorded on the appropriate State site forms. Inventoried sites shall include a site number. Official site designations assigned by an appropriate State agency are preferred. However, if temporary site numbers will be used in either the draft or final reports, they shall be substantially different from the official site designations to avoid confusion or duplication of site numbers. Known sites shall have their State site forms updated as necessary.

m. Evaluation and Conclusions: This section shall evaluate and formulate conclusions concerning site/sites location, density, size, condition, distribution, and significance in relation to the local and regional archeology and history. This section shall also discuss the potential and goals for future research. The section shall also discuss the reliability of the analysis or other pertinent data recovered (e.g., site locations, types, distribution, etc.); relate results of the study and analysis to the stated study goals; identify changes, if any in the research goals; synthesize and compare the results of the analysis and study; integrate ancillary data; and identify and discuss cultural/behavioral patterns and processes that are inferred from the study and analysis results.

n. Recommendations: This section shall discuss the direct and indirect impacts affecting the area's cultural resources with specific management recommendations on all previously recorded and newly discovered sites; discuss the significance of sites to the extent permitted by the study level in relation to the research goals established in the study; make recommendations on the potential eligibility of the sites to the National Register of Historic Places' recommend future intensive level research priorities and needs; and make suggestions with regard to the Corps of Engineers planning goals. These recommendations shall include a time and cost estimate. If it is the Contractor's assessment that no significant resources exist in the study area, the methods of investigation and reasoning which support that conclusion will be presented. If certain areas are not accessible, recommendations will be made for future consideration. Any evidence of cultural resources or materials which have been previously disturbed or destroyed will be presented and explained.

o. References: This section shall provide standard bibliographic references (American Antiquity format) for every publication cited in the report. References not cited in the report will be listed in a separate "Additional References" section.

p. Appendix: This section shall include the Scope of Work; resumes of all personnel involved; all correspondence derived from the study; all State site forms; all testing and any other pertinent report information referenced in the text as being included in the appendix.

6.03 Failure to fulfill these report requirements will result in the rejection of the report by the Contracting Officer.

7.00 FORMAT SPECIFICATIONS

7.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all black and white photographs which appear in the final report.

7.02 All text materials will be typed, single-spaced (the draft reports should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches, with a 1.5-inch binding margin on the left, 1-inch margins on the top and right, and a 1.5-inch margin at the bottom, and will be printed on both sides of the paper.

7.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

7.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

7.05 The final report cover letter shall include a budget of the project.

7.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

8.00 MATERIALS PROVIDED

8.01 The Contracting Officer will furnish the Contractor with the following materials:

a. Access to any publications, records, maps, or photographs that are on file at the district headquarters.

b. Two sets of USGS Quadrangle maps of the project area. One set will be used as field maps, and one set will be returned to the Corps of Engineers designating site numbers and locations, and areas surveyed and tested.

c. A letter of introduction signed by the St. Paul District Engineer explaining the objectives of the work and requesting cooperation from private landowners, if requested.

9.00 SUBMITTALS

9.01 The Contractor will submit reports according to the following schedules:

a. Field Report: The original and one copy of a field report will be submitted after completion of the field work. The field report will summarize the work, project/field limitations, methodology used, time utilized, and survey results.

b. Project Field Notes: One legible copy of all the project field notes will be submitted with the draft contract report.

c. Draft Contract Report: The original and 10 copies of the draft contract report will be submitted on or before days after contract award. The draft contract report will be reviewed by the Corps of Engineers, the State Historic Preservation Officer, the State Archeologist, and the National Park Service. The draft contract report will be submitted according to the report and contract specifications outlined in this Scope of Work.

d. Final Contract Report: The original and 15 copies of the final c/ntract report will be submitted 60 days after the Corps of Engineers comments on tne draft contract report are received by the Contractor. The final contract report will incorporate all the comments made on the draft contract report.

e. Site Forms: All completed State site forms will be submitted to the appropriate State agency.

9.02 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other material of any nature obtained or prepared under the contract within specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in distributions to the public.

10.00 METHOD OF PAYMENT

10.01 Requests for partial payment under this fixed price contract shall be made monthly on ENG Form 93. A 10 percent retained percentage will be withheld from each partial payment. Upon approval of the final reports by the Contracting Officer, final payment, including previously retained percentage, shall be made.

APPENDIX B : Curriculum Vitae of Contractor

Autumn 1983

PII Redacted

NAME: Gibbon, Guy Edward

[redacted]

PHONE: 612-926-3305 (home) 612-376-3256 (office)

EDUCATION: Kenyon College, Gambier, Ohio 1957-1959
University of Wisconsin-Madison 1959-1960, 1963-1964
B.S. degree in Anthropology, June 1964
University of Wisconsin-Madison 1964-1969
M.S. degree in Anthropology, June 1966
Ph.D. degree in Anthropology, August 16, 1969

AREAS OF INTEREST:

Culture Change. History and Philosophy of Archaeology. Archaeological theory with an emphasis on formal theory construction, explanation, and the relationships between mathematical modelling and theory construction. Post-Pleistocene North America. Post-Pleistocene western and central Europe.

POSITIONS HELD:

Visiting Assistant Professor of Anthropology, University of Illinois, Urbana-Champaign, 1969-1970, summer 1970.

Assistant Professor of Anthropology, University of Illinois, Urbana-Champaign, fall 1970 through summer 1972.

Visiting Assistant Professor of Anthropology, University of Wisconsin-Milwaukee, fall 1972 through summer 1973.

Visiting Assistant Professor of Anthropology, University of Minnesota, summer 1972.

Assistant Professor of Anthropology, University of Minnesota, fall 1973 through June 1976.

Associate Professor of Anthropology, University of Minnesota, June 1976 through the present date.

Acting Director, Center for Ancient Studies, University of Minnesota, summer 1981 through the present date.

Bibliography

1970 "A Brief History of Oneota Research in Wisconsin." In Wisconsin Magazine of History 53(4): 278-293. Madison.

1970 "The Midway Village Site." In The Wisconsin Archaeologist 51(3): 79-162. Milwaukee.

1971 "The Bornick Site: A Grand River Phase Oneota Site in Marquette County." In The Wisconsin Archaeologist 52(3): 85-137. Milwaukee.

1971 Review of: Johnson, The Prehistoric Peoples of Minnesota; Wilford, Johnson, and Vicinus, Burial Mounds of Central Minnesota; Wilford, Burial Mounds of the Red River Headwaters; Bleed, The Archaeology of Petaga Point. In American Antiquity 36(1): 123-124. Salt Lake City.

1972 "Cultural Dynamics and the Development of the Oneota Life-Way in Wisconsin." American Antiquity 37(2): 166-185. Salt Lake City.

1972 "The Walker-Hooper Site: A Grand River Phase Oneota Site in Green Lake County." In The Wisconsin Archaeologist 53(4): 149-290. Milwaukee.

1972 Review of: Dale R. Henning, "Development and Interrelationships of Oneota Culture in the Lower Missouri River Valley." The Missouri Archaeologist 32 (1970). In Plains Anthropologist 17(56): 161-162.

1973 The Sheffield Site: an Oneota Site on the St. Croix River. Minnesota Prehistoric Archaeology Series No. 10. 62 pages. Minnesota Historical Society. St. Paul.

1974 "A Model of Mississippian Development and Its Implications for the Red Wing Area." In Aspects of Upper Great Lakes Anthropology, Elden Johnson (ed.), pp. 129-137. Minnesota Prehistoric Archaeology Series No. 11. Minnesota Historical Society. St. Paul.

1974 Review of: Raymond B. Chaplin, The Study of Animal Bones from Archaeological Sites. 1971. Seminar Press. In American Journal of Physical Anthropology 40(1): 107-108.

1974 "Archaeological Survey of the Sibley County Generating Plant Site." Ms. Northern States Power. 6 pages.

1975 "The Brower Site: A Middle Woodland Mound and Camp Site on Lake Onamia." In The Minnesota Archaeologist 34(1 and 2): 1-43. St. Paul.

1975 "The Crace Site: A Late Woodland Special Activity Site on Lake Onamia." In The Minnesota Archaeologist 34(3 and 4): 49-70. St. Paul.

Bibliography

1976 "Archaeology and Prehistory, North America." In Dictionary of American History, pp. 154-158; also short topic articles on pp. 11, 83-84, 117, 289, 300, 319-320, 334, 352-353, 370, 382-383, 385-386, 402-403, and 484. Scribner's Sons, New York.

1976 "The Use of Taxonomic Aids in the Hierarchic Grouping of Ceramics." Canadian Archaeology Abroad, P.L. Shinnie et al. (eds.), pp. 251-260. Calgary.

1976 "The Old Shakopee Bridge Site: A Late Woodland Ricing Site on Shakopee Lake." In The Minnesota Archaeologist 35(2): 1-56. St. Paul.

1976 Review of: Marshall McKusick, The Grant Oneota Village. Report No. 4, Office of the State Archaeologist, University of Iowa. 1973. In Plains Anthropologist 21(71): 78-80.

1977 Prehistoric and Historic Archaeological Sites Survey of Voyageurs National Park. Ms. National Park Service. 353 pages.

1978 Spring Shoreline Survey of Voyageurs National Park. Ms. National Park Service. 53 pages.

1978 "A Simplified Algorithm Model for the Classification of Silvernale and Blue Earth Phase Ceramic Vessels." In Some Studies of Minnesota Prehistoric Ceramics: Papers Presented at the First Council for Minnesota Archaeology Symposium, 1976. Occasional Publications in Minnesota Anthropology No. 2. Minnesota Archaeological Society. St. Paul, pp. 3-11.

1979 The Mississippian Occupation of the Red Wing Area. Minnesota Prehistoric Archaeology Series No. 13. Minnesota State Historical Society, St. Paul. Microfiche.

1980 "The Middle to Late Woodland Transition in Eastern Minnesota," with Christy A.H. Caine. Midcontinental Journal of Archaeology Vol. 5(1).: 16 pp.

1980 An Archaeological Survey of Nobles, Pipestone, and Rock Counties, Minnesota. Unpubl. Ms. Minnesota State Historical Society. 85 pp.

1981 Review of: Archeology and a Science of Man by Wilfred T. Neill. Columbia University Press (1978). British Journal for the Philosophy of Science 32: 106-109.

1981 Test Excavations at the Gideon Pond Historic House Site. 29 pp. Unpubl. Ms. The City of Bloomington, Minnesota.

1981 Phase I Cultural Resources Survey, Battle Creek Project I. 45 pp. Unpubl. Ms. Ramsey-Washington Metro Watershed District. Minnesota.

1981 One Hundred Years of Upper Midwest Archaeology. Upper Midwest History Vol. 1, pp. 41-53.

1982 Does Minnesota Have an Early Woodland? In Early Woodland Complexes in the Eastern United States. T. Emerson, editor. In press.

1982 The Blue Earth Phase in Southern Minnesota. Journal of Iowa Archaeology. Monograph. In press.

1983 Archaeological Reconnaissance of Big Sandy Lake, Minnesota. With Terri Leistmann. U.S. Army Corps of Engineers, St. Paul. Unpublished manuscript.

1983 Prairie Archaeology. Editor. University of Minnesota Publications in Anthropology No. 3. 170 pages.

1983 "First-Step" Settlement Subsistence Models for the Rock River Drainage in Southwestern Minnesota. In Prairie Archaeology, G. Gibbon editor, pp. 131-149. With Homer Hruby.

1983 Oneota Studies. Editor. University of Minnesota Publications in Anthropology No. 1. 122 pages.

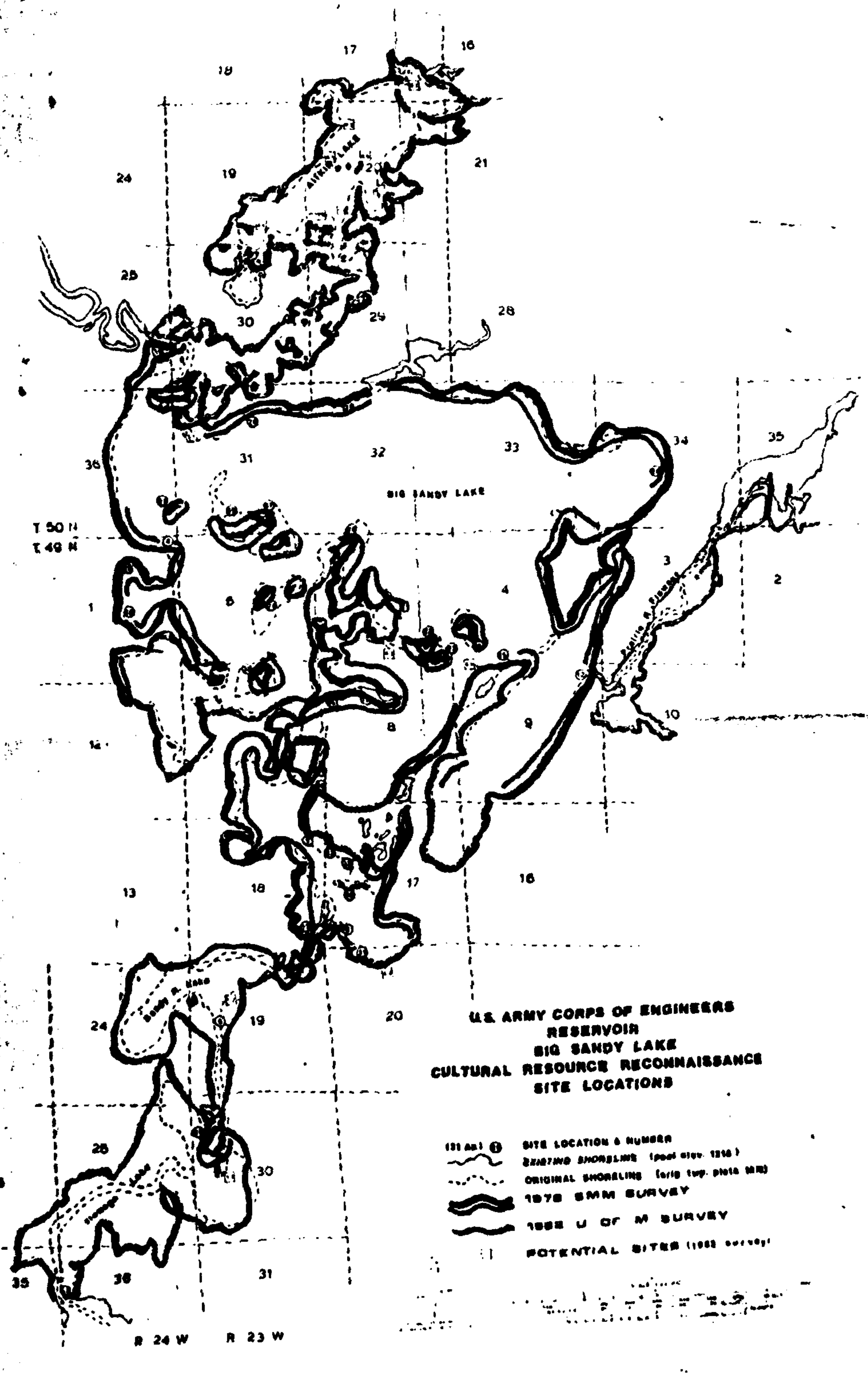
1983 Oneota Origins Revisited. In Oneota Studies, G. Gibbon, editor, pp. 85-89.

1983 Positivism and the New Archaeology. Paper submitted to American Antiquity.

1983 Classical and Anthropological Archaeology: A Coming Rapproachement? In Studies in Aegean Archaeology, edited by William Coulson and Nancy Wilkie. University of Minnesota Publications in Ancient Studies, Vol. 1. In press.

1983 The Mississippian Presence in Minnesota. With Clark Dobbs. In Mississippian Complexes in the Eastern United States. T. Emerson, editor. In press.

1983 Anthropological Archaeology. Columbia University Press. Scheduled for publication early fall 1984.


U.S. ARMY CORPS OF ENGINEERS
RESERVOIR
BIG SANDY LAKE
CULTURAL RESOURCE RECONNAISSANCE
SITE LOCATIONS
SITE LOCATION & NUMBER
EXISTING SHORELINE
ORIGINAL SHORELINE
SMM SURVEY
U OF M SURVEY
POTENTIAL SITES
BIG SANDY LAKE
T 50 N
T 49 N
R 24 W
R 23 W